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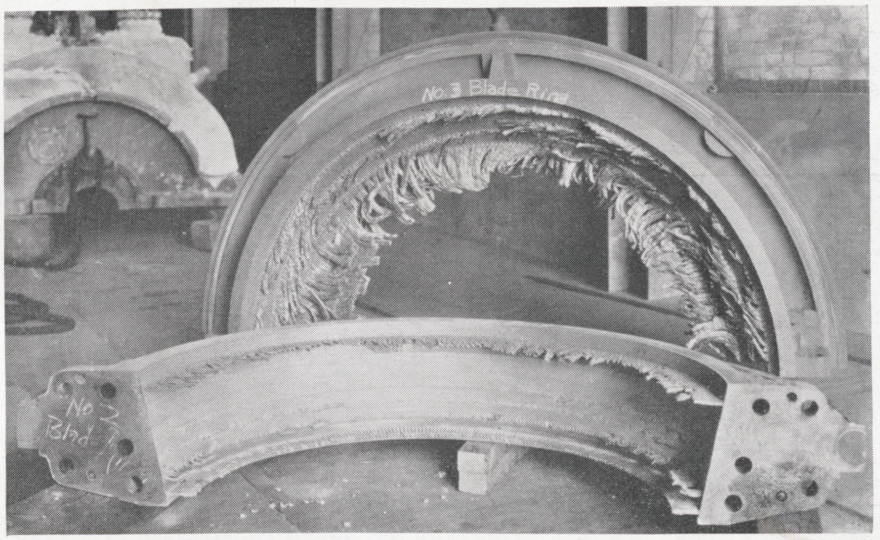


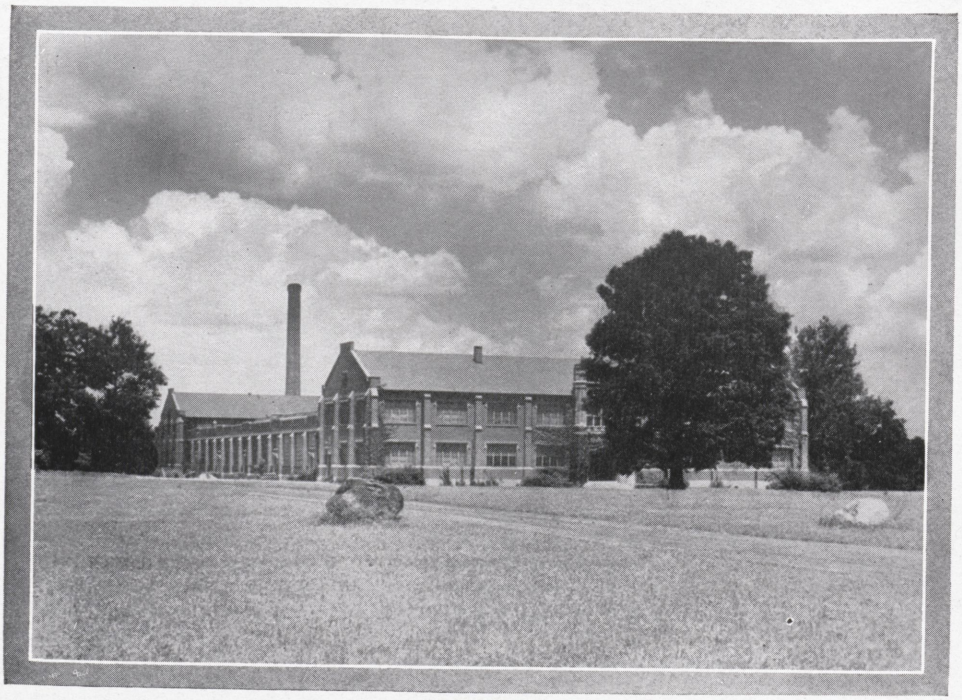
ROSE TECHNIC

Member

ENGINEERING COLLEGE MAGAZINES ASSOCIATED

Published by the Rose Polytechnic Institute, Terre Haute, Indiana

OCTOBER 1931



Good Engineers are an Asset to Any Country

INDUSTRIAL PROGRESS

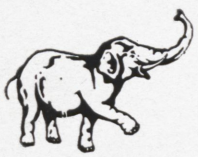
depends upon technically trained men for Leaders.
The students of technical schools must
assume this responsibility of leadership

Rose Polytechnic Institute

"A College of Engineering"

Terre Haute - Indiana

THE ROSE TECHNIC



Vol. XXXXI

Number 1

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Mr. Williard V. Merrihue, Chairman, 1 River Road, Schenectady, N. Y.

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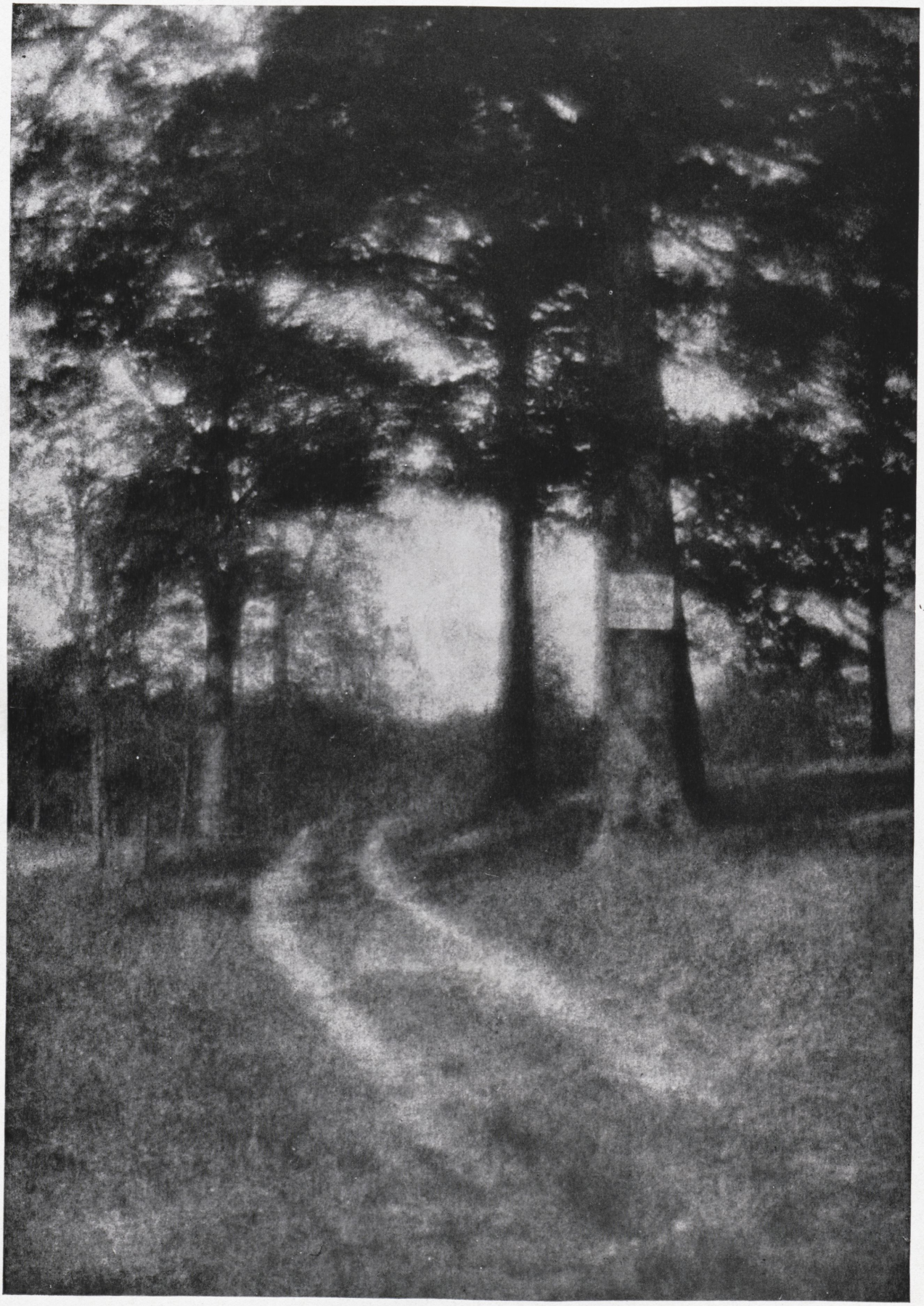
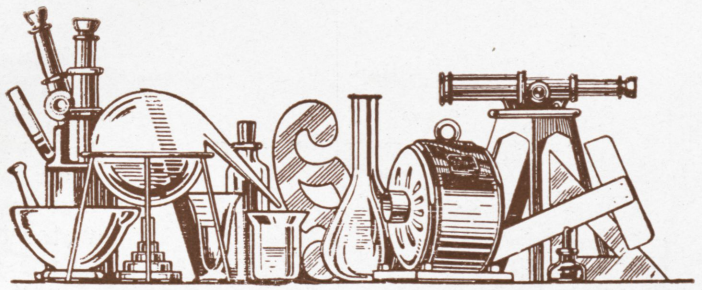


The Back Road



THE ROSE TECHNIC

THE TECHNICAL JOURNAL OF THE ROSE POLYTECHNIC INSTITUTE

Volume XXXXI OCTOBER 1931 Number 1

The United States Patent Office as

Museum of Freaks

Harold B. Hood, '24

In an article recently published in the Technic, I discussed rather generally the subject of patents from the standpoint of the engineer's career. That article was intended to be somewhat educational, while this one is intended to be purely amusing and should, perhaps, appear on Dick Toner's page, for we are going to look at a few of the freaks, which, in one way or another, have managed to escape the critical blue pencil of the Examiner and to find their way into the patented art.

Many people attempt to patent devices and ideas that are hopelessly impractical or absolutely absurd. Mr. Hood, as a patent attorney, frequently comes across such "freaks", and he tells here of some of the most interesting ones.

—The Editor.

Perpetual Motion is Not Acceptable

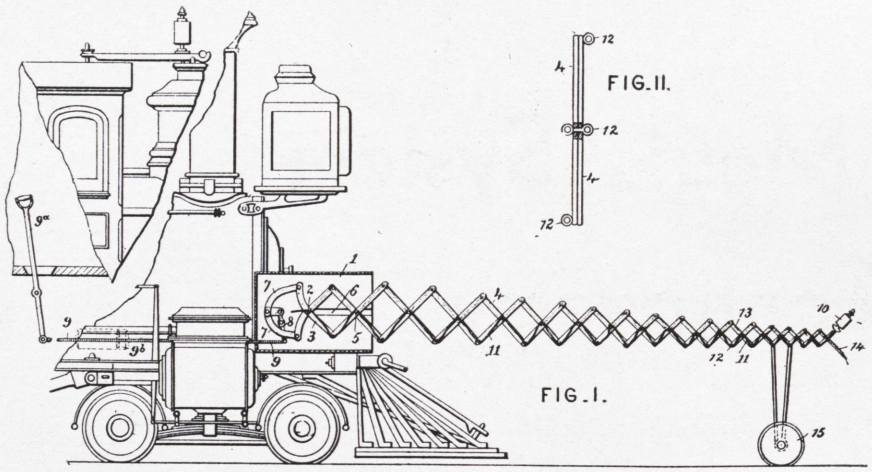
Of course, the perpetual motion crank is always with us and occasionally files an application for patent. Very few of his brain children, however, are to be found in the files of issued patents, for applications of that character are dealt with rather summarily. When such a one is filed, the Patent Office communicates with the inventor advising him that he may, if he wishes, withdraw his application and have his filing fee refunded, and that if he does not withdraw it, the Examiner's first action will be to reject it on the ground that the device therein illustrated is inoperative, and that the Examiner will not recede from that position unless a working model of the device is filed with him. Very few applications for perpetual motion machines get beyond that point.

In the field of vehicles, one of the earliest amusing devices is illustrated in a patent issued in 1899, and covering a device for repelling vicious dogs who show a disposition to attack bicycle riders. It comprises one or more containers adapted to be filled with snuff or pepper and having perforations therein, together with a bulb for forcing air into the containers, whereby the powder will be sprayed outwardly through the perforations. The patentee (who, by the way, was a woman) says, "It is obvious that a sprinkling of red pepper or other similar substances will immediately cause a dog to desist from further attack."

Railroads Receive Their Share of Attention

Perhaps some of the difficulties encountered in obtaining satisfactory protection for the school driveway might have been overcome if the authorities of the traction company had been acquainted with a patent issued in 1885 to William Bell. The drawing of this patent is reproduced here, and its intended operation will surely be obvious without further discussion.

Brother Simmons, who apparently was in the prime of his genius in 1894, was an economical soul who hated to think of the



William Bell Solves the Highway Grade Crossing Problem

idea of railroads being forced to lay double lines of track. He conceived the idea that it might be advantageous to run trains in opposite directions simultaneously, upon the same track, so he invented a mechanism to accomplish this purpose. Each train was provided at its front and rear ends with inclined trackways leading from a point substantially flush with the railroad track to and over the top of the train. When two trains proceeding in opposite directions met, one of them (Brother Simmons does not explain which one) was expected to run up the track mounted on the top of the other train, pass over and return to the main track, then proceed joyfully on its way. This marvelous invention must have been conceived at about the time when one of our sovereign states adopted a statute which provided that when two trains running upon intersecting tracks approached the intersection at substantially the same time both trains must come to a complete stop and neither should proceed until the other had passed.

A gentleman by the name of Kerekes of Bridgeport, Conn. had in 1906 a somewhat similar idea. Having read of the telescoping of cars by head-on collision, he conceived the idea that a carriage bearing an inclined ramp and located between the tender of the locomotive and the first car of the train would prevent such telescoping. His idea was that when engines met head-on, the ramp on the carriage would run in under the tender and the locomotive and that the power expended in lifting these along the ramp would sufficiently cushion the momentum of the rest of the train to prevent telescoping. Maybe he was right. Who knows?

Just a Hot Air Device

Many devices have been conceived for preventing street cars and vehicles from running over persons or animals knocked down in their path. One of the most ingenious and ingenuous of these is the device of John Enright, who provided a perforated tube extending across the front of the vehicle and connected to a tank of compressed air. Mr. Enright in his patent states confidently that when air is released through the perforations of the tube "a person will be simply blown off the track". Not only the device of the patent but the patent itself appears to have depended rather completely on hot air.

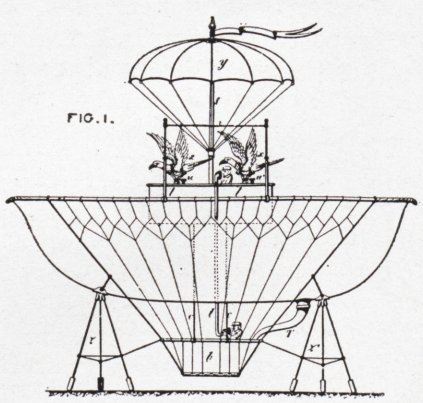
In 1908 there was disclosed to the world, through the medium of a patent, the reason for "that tired feeling" after a four-hundred-mile drive. The patentee assures us that the fatigue is primarily due to the large amount of static electricity generated in the vehicle "due to its movement and, possibly also, to its vibration". The patentee solved the whole problem of fatigue resulting from the driving of the horseless carriage by providing means for grounding the rear axle of the vehicle, thereby relieving the occupants of the enervating effect of this enormous charge of static electricity. One of his ideas was to provide a metallic container secured to the axle and to permit a small stream of water to run from the container to the ground, the water stream constituting the grounding conductor.

Eagles, Vultures, Condors, Etc.

And now we come to the field of aeronautics. Here is a rather complete illustration of what the patentee apparently considered to be a highly practical device. The birds marked X are specified in the patent to be "eagles, vultures, condors, etc." I wonder if the sour expressions of the navigators in the drawing can be due to some failure of the airship or its motive power. One of these gentlemen was intended to be provided with mechanism whereby he could rotate the platforms on which the birds were secured and thus direct the course of the wonder ship.

As late as Oct. 2, 1928, there was issued a patent covering what the patentee termed a seaplane or airplane station. This device comprises an annular trackway supported high above the ground and carrying a depending support movable thereon. The support is provided at its lower end with a plurality of hooks, and the patentee's idea was that an airplane provided with a cable secured to and ele-

(Continued on page 18)



An Aid for the Birdman

The Metric System Controversy

In these days of agitation concerning the adoption of the metric system, it is only fair that both sides of the question should be stated as viewed with proper perspective, and without prejudice. The Editors take pleasure in presenting the matter here from the viewpoint of the American Institute of Weights and Measures.

Many people in this country are being persuaded that a great step most urgently needed in industry and commerce is a "single standard of measurement." It is alleged that a single standard has been attained in respect to the measurement of time, of latitude and longitude, of angle and circle division, of our decimal system of numeration, and so on. Let us review briefly why this "single standard of measurement" in industry and commerce is being urged on us, and then point out why the idea is a fallacy.

But before doing so, let us just mention that the proposal of the "single standard enthusiasts" is to "bring into universal acceptance by all countries of the world" the well-known Metric System of Weights and Measures which has now been accepted as the legal system in 31 countries.

Those who advocate the metric system as the universal language of quantity point out that our customary units, like foot, inch, pound, and so on, had their origins in obscurity, when the length of the forearm, the length of the top joint of the thumb, the amount of anything which would make a good handful, and so on, were the devices chosen by primitive tribes to facilitate the exchange of goods and produce.

They claim that such vague units varied from tribe to tribe, as indeed they certainly did, and that it was not until the metric system was invented about 150 years ago that there was anything like "standardization" in measurement by which a unit with a given name in use in one part of the world would mean the same quantity in any other part of the world; or indeed in the next tribe, county, or state, in the same country.

The inch, foot, yard, mile; ounce, pound, ton; quart, gallon, barrel, bushel, which we use in this country today, are visualized by the metric-system enthusiasts as our inheritance of archaic weights and measures; and are set up as a cause of our aloofness from the other nations of the world. And it is pointed out continually that we have not advanced to the position of the leading nation because of our "conglomerate system of weights and measures," but in spite of it.

It is pointed out too that when Arabic numerals were introduced it took 150 years for them to replace the old Roman numerals, I, II, LV, X, L, C, etc., compared with which the advance of metric weights and measures has been phenomenal. "Since 1790, all of the nations of the world but two, the United States and Great Britain, have made the change to metric measures, and since 1920 we find that some 339,509,000 people of the world have adopted the metric system for general use."

Speaking at a recent joint meeting of the American Metric Association and the American Association for the Advancement of Science, Dr. Arthur E. Kennelly, of Harvard University, one of the best known scientists in this country, said; "Looking back during the last twenty years into everyday American literature comprising, say newspapers, journals, and magazines, one cannot fail to be struck by the general increased use of the international metric system. Today the frequent use of the metric terms has so familiarized the American public with these international units that they now pass into current newspaper and magazine text without any translation, explanation, or comment."

To demonstrate this, it is pointed out that the eye-glasses one wears, the watch one wears, the magneto one has in his automobile, the ball bearings that make for smooth riding, the drugs one buys, and so on, are entirely "metric."

Dr. Samuel W. Stratton, head of the United States Bureau of Standards for many years, in a report made on the metric system which was later accepted in testimony on behalf of a bill before Congress to make the Metric System of Weights and Measures compulsory in the United States named more than a dozen leading industrial concerns of this country that were using metric weights and measures "to a large extent, if not exclusively."

Mr. F. L. Roberts, writing for the American Metric Association, in *Instruments*, June, 1930, said:

"Its (metric system) progress would be greatly accelerated if the people of the United States and

(Continued on page 20)

Amateur Movies in INDUSTRIES

The 16 mm. movie film, once a rich man's toy, has lately developed into one of industry's greatest assets. It is used more and more each day in industrial and construction enterprises to provide complete visual records of operations, to promote sales, and to teach safety.

G. Ewing Farrington, m. '33

Many of us can remember the days of the nickelodeon and its flickering pictures, with the long wait between reels. A specially trained staff was required to make the pictures, and extensive use of equipment was involved. Today any amateur can make movies of any scene he can see, and of many motions he cannot see. Most of the credit for this accomplishment goes to the men who introduced the small 16 mm. film. We are now able, with the use of this film, to photograph high speed and complex motions as easily as we can take snapshots with a box camera.

The simplification of moving pictures using the 16 mm. film and the effected economies created a new method of obtaining records and of studying swift motions, processes, and reactions. This is all accomplished without an interruption to the production schedule due to distraction of the workers or hampering of operations.

Economies

These economies are effected in many ways. The price of a 16 mm. camera compared to a standard 35 mm. camera is extremely low. The film costs approximately half the price of the standard size and embodies the "reversal" emulsion which eliminates the making of a separate positive from the negative film. The developing costs are thus materially reduced. Anyone who can focus a camera can satisfactorily operate the small amateur machine and thereby save the expense of a cameraman.

The small portable projectors cost considerably less than the corresponding standard size and require no complicated equipment.

The Benefits of Slow Motion Pictures

Slow motion can be shown by attaching a four-to-one ratio, which runs the film at one quarter normal speed. The film can also be projected one "frame" at a time, enabling each motion to be studied individually. This advantage allows nothing to pass unseen, no matter how complicated or how fast.

Many industrial operations such as assembling, sorting, and packing involve actions of such rapidity that the eye cannot follow them. Were it not for slow motion pictures and single frame projection, the exact nature of the movement would never be known. An example of this nature was forcefully brought out a short time ago. Upon examining a very efficient worker the fact was disclosed that that particular worker used only the left hand, while others enlisting the aid of the right hand could not produce as much. Many times this worker explained and demonstrated the method, trying to show every detail, but no one could detect any difference between the movements. A slow motion picture revealed an action of one of the fingers, of which the worker was unaware, that contributed essentially to the efficiency. By viewing the film, other employees quickly acquired the method, and a resultant of increased production occurred.

There is a similar case in which a leading airplane designer found that it was impossible to read the many required dials at one time, while the plane was in test flight. By taking a moving picture of these instruments he obtained a record of the entire test, and discovered some rapid fluctuations which his eyes could not detect.

While slow motion pictures are used extensively in motion analysis and in instructional work, normal speed pictures are equally valuable in other phases of industrial activity.

Wide Range of Applications Possible

An American rubber company recently developed an efficient method for tire building. In attempting to describe this method for the benefit of an English subsidiary by the customary means

The Field Engineer Turns Cameraman

of description and drawings, it was found difficult to present the subject in such a manner that the English company could make use of it. A one hundred foot 16 mm. film was made by an employee and sent to the English company. Display of the film cleared up all of the points in doubt and permitted full adoption of the efficient American method. This movie demonstration was so clear and instructive to the English company that the company made a similar film dealing with an English process that was not clear to the American company, with equally beneficial results.

A leading telegraph company has made some very interesting films for instructing its employees. One of these, a reel called "Gumming", is proving successful in teaching employees how to apply printed tape to the telegraph blanks as the tape comes from the machine. Another reel, "Keyboard Errors", teaches the operators how to increase their speed and efficiency and lessen the number of mistakes by avoiding certain positions and movements which are known to cause errors.

Sixteen millimeter movies are valuable for recording new developments under test. A small movie camera will see the whole procedure from a vantage point too close for safety and will make a permanent record of all details, some of which may be indistinguishable to the human eye. Tests of this nature are being recorded on high tension transformers, on explosives, on automobile and airplane engines running at excessive speeds, on alloys subjected to compression, tension, shear, and torsion, and on the actions of concrete beams and piles under heavy loads. Undoubtedly there are many more uses besides those mentioned.

Industrial concerns with stockhouses and branches have found the use of the amateur movie helpful in disseminating knowledge or information to these outposts. Especially is this procedure effective in the case of the foreign branches. The more information an employee has concerning the products which he helps to produce and sell, the greater asset he is to his company. Realizing this fact, several far seeing employers have made 16 mm. movies at their various plants for interplant exchange and the edification of their employees.

Construction Work Proves to be Ideal Field

Building contractors and structural engineers are finding the 16 mm. film a valuable asset for making permanent, authentic visual records of their construction work. By the taking of a few feet of film at regular intervals, the entire building process from the turning of the first bit of soil to the driving of the last rivet is recorded. A construction project taking many months to accomplish can in this way be shown on the screen in a few minutes; and yet at any stage of the work the projectors may be stopped and a scene may be viewed as a still picture. Through the use of dated titles, the rate of progress between the periods of construction may be noted. Such information proves to be a valuable aid in computing costs based on the rate of progress when future contracts are estimated and undertaken.

Instruction in Safety is Facilitated

Motion pictures provide the best method of teaching the principles of safety to employees. Pictures taken in the plant illustrate the particular points of danger, and the inevitable results of carelessness are driven home with an impression that is lasting. It is hard for a worker to believe that he is in danger or that he is not immune to injury. Consequently, though his very life may be in jeopardy, he becomes careless and some day will meet with serious injury.

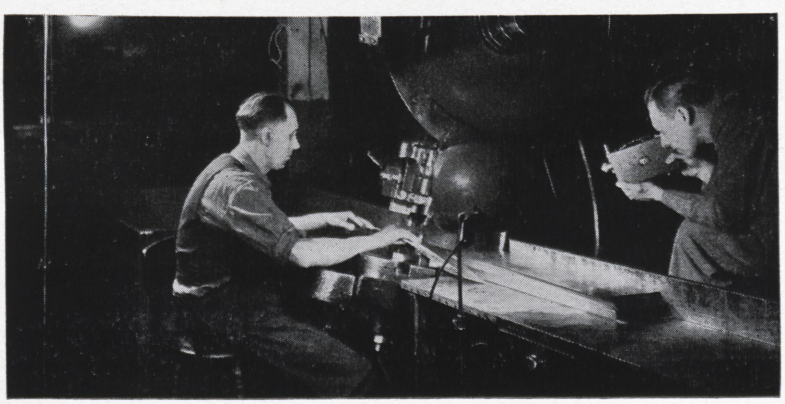
To give the new employee a broad knowledge of the company for which he works, whether it be in safety or in general plant operations, and to make him become a part of the company in the least possible time, there is nothing so effective as a movie trip through the various factories.

Conclusion

The relatively low first cost of the amateur movie outfit makes its use practicable in a very great number of industries. For indoor factory pictures some artificial light will in most cases be necessary. However for a camera equipped with an f. 1. 9 lens, the amount of light needed for any picture may be easily obtained by one or more flood lights.

Projection is even more simple than the taking of the pictures. The modern projectors operate from the standard 110 or 220 volt current, and hence are extremely portable.

Rapid service is given on the developing of the films, and for those concerns which have a sufficient volume of work, the "reversal" emulsion expedites the work.



Standard Practice Study and Employee Training are Greatly Facilitated

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

Help the Technic

Since this issue of the Technic is the first to be seen by the freshmen as their own school magazine, a few words to them are certainly not out of place. While these suggestions are primarily for freshmen, they are equally applicable to upperclassmen, though to most of the latter they present no new ideas.

First of all, the Technic is not merely the magazine of your school but your magazine of your school. Therefore you should have a personal regard for it. You should take pride in it, and if it does not come up to your ideal, your suggestions will be gratefully received and carefully considered.

Aside from the service you will render to the Technic by contributions, you will receive a great deal of personal benefit from obtaining and arranging the material and writing an article. Nothing is better for a would-be writer than writing; and "breaking into print," a very valuable but usually difficult incentive, is easy enough in this case to be an unusual opportunity. It is wise to consult an editor as to the likelihood of acceptance, but with any assurance whatever, go ahead and produce your copy. As an additional incentive, one honor point is given for each published article.

If your ability lies in the line of editorials and you have any ideas, submit them either complete or as merely ideas.

The idea is to help in some way and keep the Technic improving as it has done in the past.

Your Text Book

A practice which, though not universal, is nevertheless too prevalent, is that of selling textbooks immediately after the course in which they are used is completed. One of the chief aims of a course is to familiarize the student with the material in the book so that, while he will probably not remember the specific facts, he will remember where to find them. No one could be expected to retain all the facts he will need in practice or in later courses, so the importance of this training is evident. Also, additions to text material are often made by the instructors and recorded in the text.

In view of these facts, it seems strange that anyone would desire to part with a text book, even at the original price, but books are, as a rule, sacrificed at half price or less, as if anything that could be realized on them was so much profit. It is certainly a better policy to keep these books as a nucleus for an engineering library.

The Graduate Course

A rather important innovation this year is the establishment of a graduate course leading to the M. S. degree. It is an effort to assist the men of last year's class and other graduates who have not jobs to use the time to advantage, rather than waste it doing nothing or working outside the field of engineering. Thus it is a sort of relief measure and it is not certain that it will be continued in coming years. The faculty this year is assuming the extra duties and classes, but if it were to be continued, new professors and new equipment would be necessary. If sufficient men desire to take the course to justify this added expense it might be continued, but if only a few wish it, it will probably stop at the end of the year. Eleven men are enrolled this year.

Reading for Pleasure

One subject rarely given sufficient attention in an engineering curriculum is reading for pleasure. The conception of an engineer as a person who uses poor grammar, has bad manners, and in every way lacks refinement is entirely too frequent and in

some cases founded on fact. Engineers often lack culture. Even the best reading is not going to convert a boor into a polished gentleman overnight, but good literature, both fiction and non-fiction, will affect anyone to some extent, will leave its mark on him for others to see, and most of all, will improve him for himself, that is, will give him a more enjoyable outlook.

Obviously, no engineering student is going to have much time to devote to reading anything except text books and possibly a few technical journals. Nevertheless, though the fifteen-minutes-a-day plan has been much maligned at the hands of the humor magazines, it has much promise and is certainly better than nothing. A great deal can be read and assimilated in the course of a year with only fifteen minutes or a half hour a day devoted to it, and if no other time could be found, sleep could be curtailed that much without serious harm.

By no means is this a plea to neglect work in favor of pleasure, but it is an urge to get the reading in addition to the work. If every student now in engineering schools would form and maintain this habit, it would do much to improve the cultural reputation of the engineer.

Research and the Depression

Research was recently defined as "learning what we can do when we can not do what we are doing now". If this is true, and it seems particularly apt, research should have an important place among efforts for relieving the depression.

This is certainly no place to discuss the depression itself, or any schemes for ending it. Almost all authorities are agreed that basic economic reasons are back of it, and that no nostrums are going to cure it. Therefore, anything that has an economic bearing, and not merely political or charitable, may aid materially. Research has always preceded vast movements and changes, and will continue to do so in this case. But how has this depression occurred if research has been advancing steadily?

While, of course, research cannot be blamed entirely, still it may have had a part in the cause. The point is that it has not been advancing steadily. During the war, there were such tremendous incentives that great progress was made. Forced schedules, overtime hours, and definite objectives accomplished wonders. In the first few years after the war, these habits carried over. The results were the wonderful industrial development made during the "Golden Age" just preceding the present trouble. As advances were made, however, a saturation point seemed to approach; research had a tendency to relax and watch industry catch up. Work became more and more standardized, machines threw men out of work faster than new ones took them back, and unemployment increased. This, added to the deeper faults in the whole economic system, combined to produce one of the greatest slumps of history.

The best solution would probably be to revise the system of profit and loss, labor and capital, competition, tariffs, and so on, but this does not seem very likely in the near future.

Another solution would be restoring research to its previous position. This would not cure anything permanently, but would relieve the stress temporarily, and make better conditions for lasting economic reforms.

Hence, at least a part of the responsibility for recovery lies with the engineers and scientists engaged in research. Above all things, research should not be decreased as a relief measure, but at any cost should be pushed forward.

Freshmen Intelligence Tests

This year, for the first time, classification of the freshmen was made partly on a basis of scholarship. On Freshman Day a standard Columbia University intelligence test was given them, two hours in the morning and one hour in the afternoon. Division into sections was made based upon this test and the high school record of the students. In this way the highest section may take advanced texts, additional work, and may "make better time". In addition to actual work done, the general attitude of all the classes is improved if all are about the same standard. The average speed of progress in the class will be a great deal nearer the correct speed for every student.

In addition this examination supersedes the tests previously given for freshman scholarships. These were awarded on the basis of the test results combined with high school record.

In all ways this test seems a great step forward in effective education.

ALUMNI

Obituary

Arthur Kendrick, president of the International Equipment Company and former Assistant Professor of Physics at Worcester Polytechnic Institute, died here today in his sixty-sixth year.

Mr. Kendrick was born in Nashua, N. H., and attended Amherst College, from which he was graduated with an A. B. degree in 1887. He received his A. M. degree from Harvard. In addition to his association with the Worcester Institute, he taught physics at Leicester Academy and the Rose Polytechnic Institute in Indiana, where he was associate professor from 1895 to 1901.

In 1901 Mr. Kendrick organized the International Instrument Company later known as the International Equipment Company of which he was president. During the World War he was a consultant on the mechanical staff of the Chemical and Gas Warfare Service.

—N. Y. Times—Sept. 23

Wilfred H. Evans '11, Electrical Supervisor, Indianapolis division of the Pennsylvania Railroad, died at his home in Indianapolis, on Aug. 31. Mr. Evans graduated as an electrical engineer and began his railroad career as a draftsman at Terre Haute.

Robert G. Laatz, m. '32

This Section

There is no doubt that the alumni section of the Technic is most interesting to the alumni. For this reason the alumni editor attempts to secure all information possible as to the activities of the alumni, but he is handicapped in many ways. Now if each alumnus would drop us a line whenever he has an item of news about himself or another Rose man, we could add greatly to the interest of the section. Can not the staff of the Technic look forward to many interesting letters from the alumni in the near future? Address Alumni Editor, Rose Technic.

Among the applications for appointment as postmaster of Terre Haute are John A. Austermiller '90, Russell A. Corban '22, and Clyde Cooper Ex-'17.

Mr. Austermiller has already served four years as postmaster 1922-26.

Mr. Corban has since his graduation been in the automobile business, at present under the firm name of Corban Battery Service.

Mr. Cooper is at present Recorder of Vigo County from which office he will retire at the close of the year.

'97 Robert A. Phillips '97 is consulting engineer with the United Engineers & Constructors, Philadelphia, Pa.

Jay H. Hall of Cleveland has a son, Jay F., who is a freshman in Rose this fall.

'98 Fred W. Schneider '98 visited the school in July. He is instructor in the department of Electricity, Murray Hill Vocational School, New York. His visit to the school was his first in 33 years.

'00 Harry S. Richardson of Cleveland has a son, Harry F., who entered Rose this fall. Mr. Richardson's oldest son, John F. Richardson, was a 1931 graduate from Rose.

'01 Martin N. Troll has a son, Donald, who is a freshman this year.

'03 John A. Cushman has a son, John A. Jr., who is among the Rose rhinies.

'06 Earle S. Butler now has two sons in Rose. Frank P. Butler is a senior, and Earle B. Butler is in the freshman class.

'10 Arthur G. Butler will represent Rose at the Third International Conference on Bituminous Coal to be held in Schenley Park, Pittsburgh, on November 16 to 21, 1931, at Carnegie Institute of Technology.

'12 James E. Spindle, Rose '12 of Grand Rapids was elected president of the Michigan Gas Association. Mr. Spindle is a representative of the technical side of the gas industry.

He went directly upon graduation to the Grand Rapids Gas Light Co. He was superintendent of manufacture when early in 1918 he joined the U. S. military forces. He spent a year in France in the air service and engineering corps.

After the war he was for some time with the Detroit City Gas Co., and on the engineering staff of the Michigan Public Utilities Commission. In 1923 he returned to Grand Rapids as general superintendent, which position he held until his promotion.

'15 Robert J. Wisley '15 visited the school this summer.

(Continued on page 25)

Campus Activities

Tom H. Batman, ch. '33

Tennis Courts

Everyone is much pleased with the new tennis courts. This is evidenced by the number of players that can be seen on them at all hours during which there are no classes. A faculty foursome, comprised of Dr. Howlett, Mr. Moench, Mr. Bloxsome, and Mr. Hoel, can be seen quite frequently on the courts. Turn about is fair play, and as the faculty instructs the students in the lecture-rooms, why not let the students enlighten the faculty on the tennis courts?

There are interesting facts in connection with the building of the tennis courts. One would hardly suspect, for instance, that the steel reinforcing inside the concrete weighs six tons!

Careless students smoking while playing (a gross practice, to say the least) have nonchalantly dropped cigarette butts upon the courts to form those nice-looking brown holes which add so much to the appearance of the courts. Please!

In view of the great interest which the students have shown in the tennis courts, there will probably be some tournaments held among the Dormitory men, or the whole student body.

Our New Handbook

We can thank the Student Council for the attractive new student handbooks which were published this year. They are quite an improvement over the ones published formerly by the Rose Y. M. C. A. Freshmen should have no trouble becoming oriented if they make a practice of carrying these little books around with them.

The Glee Club

Orville Potter, who was elected manager of the Glee Club last year, failed to return to school this year, and, consequently, a new manager had to be chosen. His place is now taken by Bob Moench. Twenty-two or more men attended the first meeting, and under the guidance of Professor Rechlin and the leadership of Joe Hunter, president, the club should accomplish much this year.

The Freshman-Sophomore Games

After the Oakland City-Rose football game the soccer game was witnessed by the spectators of the football game. Everyone enjoyed the game but the participants. Rosie, the mascot, was much in evidence, as she was pulled around the track all cleaned and shined up after almost a year of neglect. It was a moral victory for the freshmen—or was it the sophomores?

The Dormitory Election

Twenty-eight new men and twenty-seven upper-classmen, inaugurated the new year with an election of officers at the first meeting of the Deming Hall Association. J. D. McNair was elected president by a unanimous vote. The other officers are: T. H. Batman, vice-president; Charles B. Sipple, secretary-treasurer; and Robert Swoboda, sergeant-at-arms. All of these men are living for their third year at the dormitory and should be capable of holding their new positions in such a manner as to avoid all dissension in the Dormitory. The president appointed able social, discipline, and scholarship committees which began functioning immediately. The scholarship committee is capable and ready to help the freshmen with their scholastic difficulties, and a freshman with some initiative should have little trouble getting his studies.

Assemblies

At the first assembly of the school year, September 17, Professor Wischmeyer, addressing his remarks especially to the freshmen,

(Continued on page 23)

Research and Progress

Edited by Lee C. Kelsey, Jr. m. '32

Guiding Airplanes by Radio

In the procedure of guiding airplanes in the vicinity of the landing field the transmitter consists essentially of a condenser, the armatures of which are connected by an induction coil. When the condenser receives an initial charge its armatures are discharged across the coil, creating in the latter a magnetic field.

As the discharge current tends to disappear, the self-induction of the coil prolongs the flow of the current and charges the condenser in the opposite direction. With this latter charged once more the phenomena are repeated, likewise in an inverse direction. In other words the system of the condenser and coil constitutes an oscillating electrical current, the oscillations of which create waves propagating in the surrounding space. These waves are received by the airplane by means of a receiving circuit consisting of a condenser and induction coil coupled in the same manner as in the transmitter circuit. One of the armatures in the condenser is composed of the antennas of the airplane and the other is the entire mass of the airplane. The coil is made in the form of a frame whose plane is horizontal when the airplane is in the normal position of flight. The oscillating electric field produced by the transmitter induces a periodic current in the antenna of the airplane, while the oscillating electromagnetic field, of the same period, induced by the transmitter coil, in its turn produces in the frame of the receiver of the airplane a periodic current lagging with respect to the antenna current.

With the proper coupling of antenna and coil, the current which arrives at the receiver of the airplane results in the superposition of the antenna current and the coil current. By means of a Marrec filter the two component currents are equalized in such a manner that if they are opposed in phase they annul each other and thereby extinguish the sound signal produced by the receiver. It is very easy to cause alternately the currents to be in phase and in opposition. All that is necessary is to invert alternately the connection between the coil and the condenser at the transmitting station, for in doing this the direction of the magnetic field is changed without any change of the electric field.

Theoretically the operation of the device is such that in the first place the pilot is informed of the moment when he crosses the boundaries of the landing field, and in the second place he is informed of the moment that he has decended to a certain distance above the field. It is claimed, however, that the precision with which these two important time periods are estimated is quite exact. On the other hand, it is claimed by the company exploiting the Loth system that it has an electrical equipment for landing fields which gives to the pilot not only general information as to the direction toward the center of the field and the contour of the latter, but also data which permit him to estimate his height above the field.

—Mechanical Engineering.

Traction Booster

This device, as its name suggests, boosts or increases the traction between the wheels of a car and the rails, without actually increasing the weight of the car, the purpose being to permit application of greater forces in order to shorten stopping distances.

Ordinarily a car is held to the rails by the pull of gravity alone—its own weight. By means of the traction booster it may be held to the rails with an additional magnetic pull. The advantage of this will be seen by a review of the following facts.

Consider first what stops a moving car. When the brakes are applied each wheel thrusts forward on the rails with a force equal to the brake shoe friction, which is opposed by an equal backward thrust of the rails against each wheel. This force acting in opposite direction to the motion of the car, causes retardation. The total brake shoe friction must not exceed the rail adhesion or sliding

will occur. Since this rail friction is thus inherently restricted by the nature of the materials in rolling contact, and the braking force thereby limited, the only remaining way to increase traction is to increase the other factor involved, the weight, and this is done by the booster.

This device consisting of a set of magnetic shoes suspended between the wheels directly above the rails utilizes magnetic attraction between the truck frames and rail. When a predetermined air-brake cylinder pressure has been built up, a pneumatically-operated switch energizes the coils in the shoes, causing the latter to move forward, but not upon the rail. This powerful magnetic attraction is equivalent to increasing the weight load on the rails without actually increasing the weight. Advantage is taken of the greater traction thus produced to increase the braking force of the air-brake system.

It should be emphasized that no retardation is produced by this magnetic attraction. The shoes do not come into contact with the rails. Full control of the braking pressure is retained by the brake system, thereby allowing its inherent flexibility to be exercised. As the shoes do not ride the rails, damage to them from cross-overs will not occur.

Normally a retardation of but 3½ miles per hour per second is about the limit, whereas with the booster a retardation of 7½ miles an hour has been attained without sliding the wheels. In addition to the advantages during deceleration, it can be used to advantage in acceleration and to assist materially in climbing steep grades.

—Scientific American.

Short Waves

Radio messages on wavelengths as low as 18 centimeters have been successfully transmitted across the English Channel, by engineers of the International Telegraph and Telephone Co.

An interesting system of broadcasting on these frequencies has been suggested by von Ardenne in Germany. By a system of multiple modulation a 7-meter wave would be modulated with 300, 400, 500, and 600 meter waves which in turn carry programs. At the receiving end, a simple frequency changer would enable a standard broadcast tuner to pick out any one of the four programs. Such a system does not save space in the ether, but it is a method of transmitting four programs at the same time from one carrier station.

Because of the vast number of 10-kilocycle channels into which the waves below 10 meters can be divided, it is certain television when finally developed will find a place in the ether of this region. Channels for many 200 kilocycle wide transmitters can be provided in many localities, all working without interference with one another. Similarly a vast number of point-to-point stations can be accommodated.

Heatless Light

There are numerous applications where intense illumination with a minumum amount of heat is required, as in operation rooms, lighting wax models, and in opaque projection. Heat is a necessary evil with all man-produced light. It has been found that 85 percent of the electric energy in the most efficient tungsten incandescent lamp is radiated as heat, not objectionable in the small household size units but becoming quite apparent in the large units.

In a new type of electric light developed in an eastern research laboratory, elimination of three-fourths of the heat with a negligible loss of light has been accomplished by absorbing the heat rays in a liquid surrounding the bulb. Distilled water, a solution of copper chloride, and other solutions will absorb heat while transmitting light. The heat can be conveyed away from this solution by means of a cooling coil through which water is circulated.

The unit consists of a lamp immersed directly in the liquid which is confined by an outer glass jacket. The cooling coil through which tap water is circulated is also immersed in this liquid. Convection currents set up within the jacket liquid are sufficient to maintain a circulation and no mechanical stirring is necessary. In case a tap water supply is not available, a radiator, such as is used with automobiles, may be employed with a closed water system. The water is then circulated by a pump and cooled by a fan. The radiator may be set at a distance.

The absorbing layer of liquid practically surrounds the light source, so that almost no radiation reaches the atmosphere of the room except through the absorbing medium. The cooling water is circulated in the coil, so that either distilled water or some other heat absorbing solution may be kept permanently in the jacket. The jacket and lamp surfaces are thus kept clean and free from the deposits even though ordinary tap-water is used as the cooling agent.

—Scientific American.

Motor Bus Impacts on Highways

When the wheel of a motor vehicle passes over an obstruction or a rough place in the surface of a highway, there are two impacts of the wheel upon the road—shock impact when the wheel comes in contact with the obstruction and drop impact when it hits the pavement following the bounce.

The trend today is toward higher vehicular speeds, particularly with the heavier wheel loads, such as in motor bus operation and the Bureau of Public Roads, U. S. Department of Agriculture, has studied the impact forces produced by the rear wheel of a modern bus operating on a concrete pavement at various speeds up to 55 miles an hour and over two types of road obstructions. The studies have included various wheel loads, sizes of tires, inflation pressures, rim dimensions and rim widths. The Rubber Manufacturers Association and the Society of Automotive Engineers cooperated in the investigations.

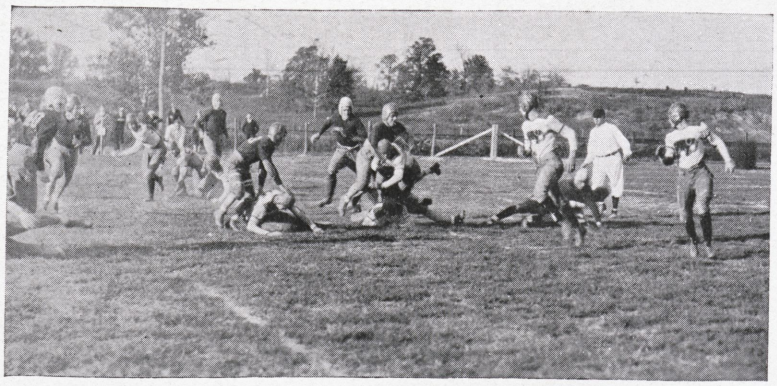
The operation of heavy vehicles at high speeds has been made practical by the comparatively recent use of high-pressure tires and balloon tires on heavy trucks and busses, says the bureau.

The tests revealed that the im-

(Continued on page 23)

SPORTS

P. Arvard Smith, Jr., ch. '32



The Football Lineup

The prospects for a winning team at Rose this year are bright indeed. After some three weeks of steady drill, despite the unfavorable weather conditions, Coach Phil Brown's charges are rapidly rounding into the best of shape and are expected to be in the proverbial pink for their initial combat of the season.

Material has been plentiful in the Rose camp this year, as one of the largest squads in the history of the school answered Coach Brown's call for candidates. Among those who reported were twelve letter men from last year's eleven, and these, along with other likely prospects, will probably carry the brunt of the attack during the first part of the season.

Hylton and Gillett, wingmen on Rose's machine of last season are slated to start at those positions. Despite the best of competition from aspiring candidates, these veterans have proven themselves to be towers of strength. Nix, 180 pound end candidate from Poseyville, has displayed a world of fight and skill in practice to date, and he is sure to break into the lineup before the season is well under way.

Coach Brown has a real problem at the tackle positions. At the present time, Heidenreich, formerly of Wiley, and Reed, last year's fullback, look to be best, but each of these men is small, weighing only 165 pounds. The Rose coach has a pair of heavies in Morrison, 195 and Pfister, same weight. These men will share the burden with the lighter tackles. Morrison played center on the basketball team. He suffered a painful cut on his face in practice but will be in shape soon. Pfister has displayed ability in the workouts to date.

Captain Tonetti, 235 pounds, is a cinch to hold his place at right guard (as he has reached the peak in his ability.) Tony is still up to his old tricks of booting over the cross bar. Make them step, Tony. Lowther will likely be the other guard. He weighs 180 and hails from Robinson, Ill. McCullough, Terre Haute, and Richardson, Cleveland, Ohio, are also outstanding and will see action as the season progresses.

Hutchins is the outstanding candidate at center. Hutchins, who weighs 155 pounds, is a letterman from last year's team. Landenberger, reserve center of last season, is also in the fold.

Cliff Pratt, tackle on the 1930 Rose machine, will start the season this year as quarter. George Adams, 157 pounds and letterman of last season, will be held in readiness for action. Adams is an excellent toe artist and will prove to be a valuable aid in that department.

Creedon and Schaack, veterans, will start the season as halfbacks, although "Sandy" Hill and Vern Henderson are slated to work as soon as they get into shape.

Smith, 150 pound letterman of last year, will probably start the season at full back. Reinking, who made a delayed entry this season will be used along with Smith as soon as he gets into shape.

There are others who are showing class and are expected to give the veterans a battle after they have had a little experience.

The athletic department of Rose is putting on sale this year for the first time season tickets, good for four home games, $1.50.

The student body should get to work upon these tickets, for it will mean better backing for our team. Moral support is an essential which no team can do without. It will get the people of Terre Haute and vicinity more interested in our Institute.

The athletic department is depending upon you fellows so let's get to work and back the team.

Rose, 19; Oakland City, 7.

Rose, 20; Earlham, 6.

Oct. 10—Franklin at Franklin.

Oct. 17—Hanover, here.

Oct. 24—Indiana Central at Indianapolis.

Oct. 31—Valparaiso at Valparaiso.

Nov. 7—Evansville (homecoming), here.

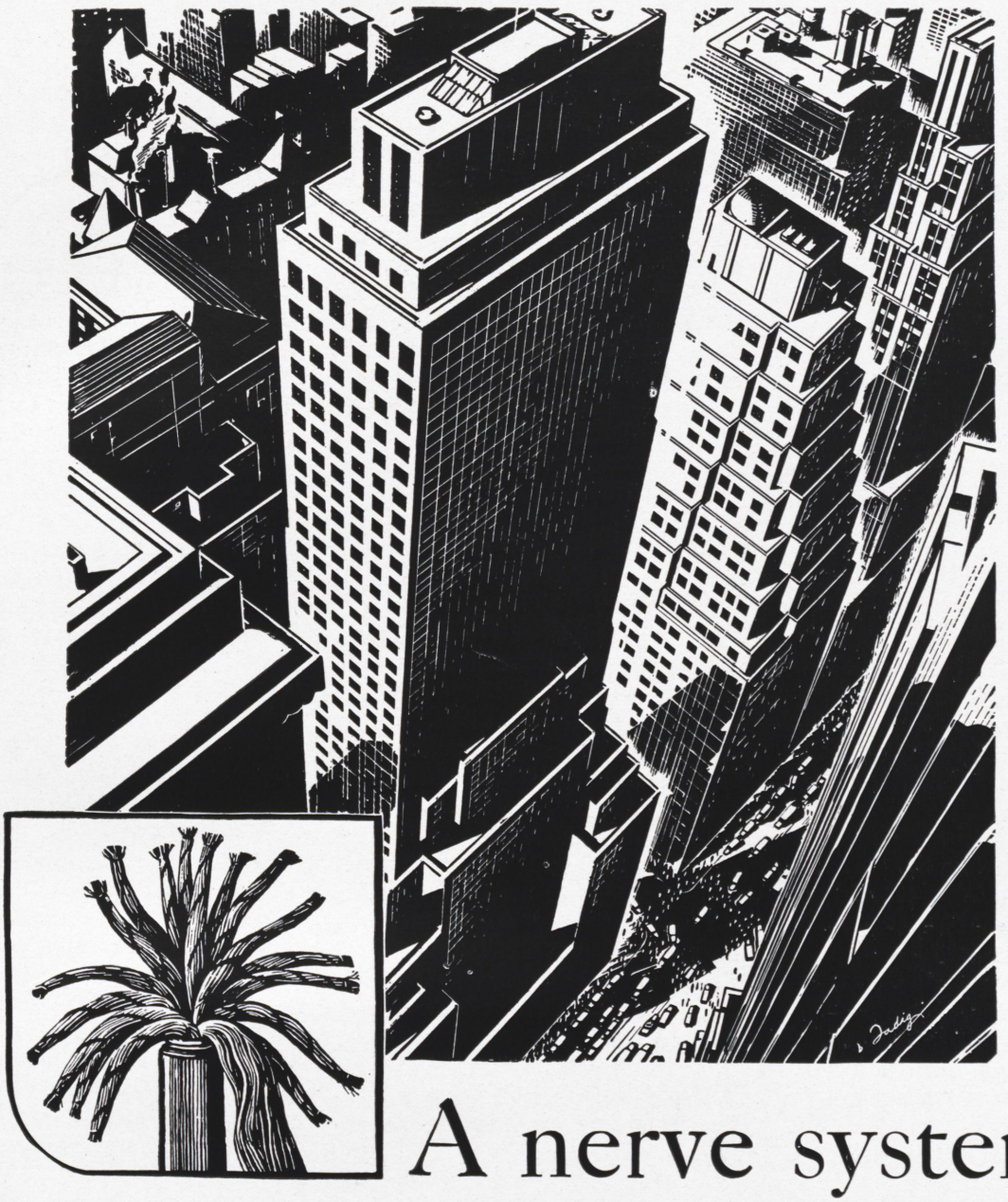
Nov. 20—McKendree, here.

The Opposition

Franklin will put an experienced team on the field. Last year after the Rose defeat, Franklin played great ball and became one of the first three teams of the state. The game this year will be a battle from start to finish.

Hanover, unbeatable by Rose

(Continued on page 19)



A nerve system for energetic skyscrapers

Long before the huge bulk of a new skyscraper looms up, Bell System men have planned its nerve system—the maze of telephone cables and wires so vital to its business activities.

From the inception of a building design, telephone engineers work hand in hand with the architects. They determine the telephone needs of thousands of future tenants. Then they plan cable shafts rising from cellar to roof and the grid of under-floor ducts that will put telephones within easy reach of every occupant.

There's a real thrill in working out these plans, for without telephones the immense structures of today would hardly be practicable.

BELL SYSTEM

A NATION-WIDE SYSTEM OF INTER-CONNECTING TELEPHONES

Freak Patents

(Continued from page 6)

vated above its upper wing might fly into the station and hook its wire to the carrier. Theoretically, the carrier would then move under the momentum of the plane around the track until finally it came to rest. While no mechanism is shown for that purpose, it is presumed that the inventor intended to provide some means whereby the airplane might then be lowered to the ground. Who will volunteer to fly the ship which first attempts a landing of this sort?

Inventors have been greatly concerned with means for waking sleepers. A patent issued in 1855 disclosed a bedstead having mechanism adapted to be operated by an alarm clock, the idea being that if the sleeper did not arise within a given period after the ringing of the alarm clock, the clock would trip a latch, permitting one side of the frame of the bed to drop to the floor whereby "we shall find ourselves ten minutes after the alarm is sounded deposited upon the carpet, permitted to arise and dress ourselves for the business of the day." Another patentee, who describes his device as one by which "the person is awakened suddenly and without a shock of any kind whatever", discloses a cup to which is attached a hose terminating in a loop provided with a plurality of perforations and adapted to be worn about a sleeper's neck. The cup being filled with water, when a co-operating alarm clock lets go, a lever operated by the clock opens a valve and permits the water to run from the cup through the hose and be discharged about the neck of the sleeper. I would hate to have this patentee do anything which he thought might be a "shock of any kind whatever."

A great deal of joking has been done based on the idea of shooting bullets around a corner. An optimistic gentleman by the name of Hope patented in 1870 a bullet adapted to fly in a curve. This bullet was provided with a curved tail, which according to the patentee's theory would cause the bullet to fly in a perfectly smooth curve. And in 1920 a Mr. Fischer of Detroit actually obtained a patent covering a gun with a curved barrel intended to shoot around a corner!

Leonard Woods of St. Louis must have been held up one night. In 1912 he filed an application for a patent on "a pistol that can be carried in the vest pocket like a watch, is readily accessible and appears like a watch, whereby it may be presented and fired at a highway man while apparently merely obeying his command to 'hand over your watch and be quick about it!' "

The Practical Scotchman Goes Fishing

William Quinn of Sturgis, Miss., was, I think, a Scotchman. In 1897 he obtained a patent for a device intended to catch fish without the use of bait. He utilized, he said, "the instinct of a fish to bite at another fish, particularly one smaller than himself." His idea of the way to utilize that instinct was to secure to his line a double convex mirror with a multiple hook adjacent each surface thereof. According to Mr. Quinn, his fish, seeing himself reflected (and reduced by the convex mirror), will be immediately urged to bite violently at himself, thus impaling himself on the cruel hooks attached to the line.

In what sort of weather do fish bite most readily? Any one knows, in rainy weather. So in 1920 a gentleman of San Diego obtained a patent for a boat provided with a sprinkling arrangement adjacent to its stern to form a spray falling upon the water in the neighborhood of the boat, thus fooling the fish into the idea that it was raining and that they really should be biting avidly.

Fishing of Another Sort

And speaking of fishing! In 1854 a native of Logansport, Ind. devised and patented a device for catching tape worms. He shows a spring trap in the form of a cylindrical, non-corrodible metal capsule having an opening therein adapted to be closed by the spring. He tells us that the object of his invention 'is to effect the removal of worms from the system, without employing medicines, and thereby causing much injury." Detailed instructions for the use of the device are included in the patent. First, the patient must fast for a length of time "of suitable duration to make the worm hungry". He then puts some food into the trap, attaching a string to it, and swallows the trap. The worm, being hungry, immediately seizes the bait "and its head is caught in the trap, which is then withdrawn from the patient's stomach by the string which has been left hanging from the mouth, dragging after it the whole length of worm." I should think that the patentee was right in saying, as quoted above, "and thereby causing much injury."

Since suspenders are coming back into vogue, perhaps there is some interest in the patent issued in 1885 and covering suspenders having attached thereto a cord which is "readily and easily detachable therefrom, whereby, in the event of a person being confined to a burning building and having all of the usual means of escape cut off, the cords can be disengaged from the suspenders and lowered to the ground to receive a rope, and thus enable the person to effect his escape." Wasn't that man a farseeing pessimist?

There is a patent, issued in 1918, covering "apparatus for irrigating plants". The patentee says that it is difficult to get water to the roots of plants, and discloses a machine which will freeze bodies of water into pellets of ice, sharp at one end. The machine comprises also a compressed air gun from which the pellets are adapted to be shot individually into the ground whereby the pellets will penetrate to the region of the roots of the plants and, melting there, properly irrigate the plant roots.

Body Heat From Canada

It's cold in Winnipeg, Manitoba, Canada. Mr. Dorsey, who lives there, has devised a novel means

for keeping warm. He illustrates a suit of woolen underwear provided with electrical heating units sewed between its layers, and adapted to be connected to contact plates on the heels of the wearer's shoes. His idea is that cities should install at spaced points on their sidewalks electrically energized plates so that the wearers of his unionsuits can plant their feet on those plates, taking a charge of electricity through the heating units of their unionsuits, and so keep warm.

Criminal Records

On March 4, 1930, there was issued to Helene A. Shelby of Oakland, California a patent for apparatus for obtaining criminal confessions and photographically recording them. Fig. 1 of that patent is reproduced below and is believed to be completely self explanatory.

Mr. Socrates Scholfield of Providence, R. I. is apparently a student of some sort of theology which I am utterly incapable of understanding. In 1914 he obtained a patent which discloses two helical springs of different pitch and which is stated to be a device for demonstrating the "existence and attributes of the Supreme Being." Perhaps you can understand the following quotation from the patent. I must confess that I cannot.

"Now, in order to establish the fact that a proper educational emblem of the idea of everlasting conscious sensibility may be constructed of material elements; it may be stated that there was a time in the history of the earth when organic life did not exist, hence the primordial molecular organization endowed with life must have been the fabricated product of certain coacting energies in the terrestrial environment; and while the various possible combinations of molecular matter could not produce life, it might be mechanically produced upon the earth by the combination of a mechanism composed of stable sensitive elements, with a complementary mechanism composed of unstable molecular elements, the field of energy pertaining to the one mechanism being separate and distinct from the field of energy pertaining to the other."

In October of 1928 there was issued a patent which covers a golf club having an umbrella nested in its handle.

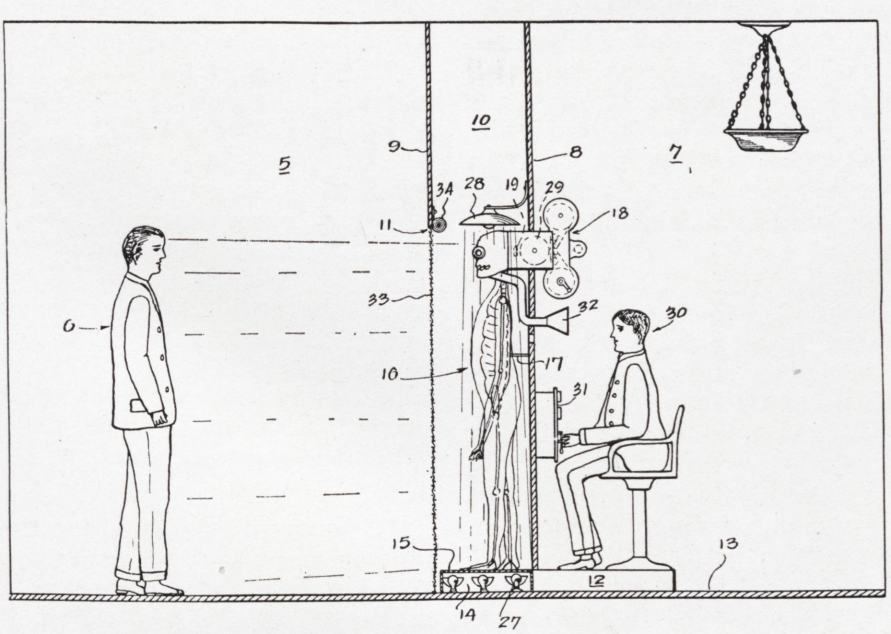
What is There to a Name?

Occasionally a laugh can be obtained from the association of an inventor's name with the device which he has invented. Thus a patent for a lighting fixture was issued in 1924 to Harry Aglow.

You may be interested also to know that on Feb. 14, 1928 a patent was issued to Harold Christ of Bethlehem, Penn., the patent covering a fire escape.

There was also a patent, issued some time ago to a gentleman by the name of Scattergood, covering a toilet seat. In the words of the famous Chic Sale, the patentee is evidently one who has to be v-e-r-y v-e-r-y careful.

Just one more unusual patent —not a freak this time. On Oct. 15, 1895 there was issued to Mr. J. W. Paige of Hartford, Conn. a patent covering the machine which was the grandfather of the present linotype machine. This patent comprises 163 sheets of drawings including 471 separate figures, 46 closely printed pages of description, and more than 70 claims. An ordinary printed copy of the patent weighs two and one-fourth pounds. A copy of this patent could formerly be purchased from the Commissioner of Patents for ten cents, the same price that is demanded for a patent comprising one sheet of drawings and one page of printed specifications and claims.



The Shelby Criminal Apparatus

Sports

(Continued from page 16)

upon her own field until last year, will furnish plenty of opposition when the team comes here, Oct. 17. They have never proved very strong upon Rose's field but the team can look for a fight.

It is reported that Valparaiso is "laying" for Rose this year. We all saw the Valpo game last year and know they can fight when they want to.

Evansville will be out for blood this year as they claim that Rose knocked them out of the state championship last year.

Little is known about McKendree which is a new team upon our schedule. They hail from Lebanon and reports show that they always have splendid teams.

The Metric System Controversy

(Continued from page 7)

Great Britain were to recognize the ultimate trend, and accept the universal language of quantity, intelligible to humankind and a potent factor in commercial development." And he added:

"The following analysis may help the reader in coming to a decision, if he has not already made one, as to whether to join this movement on behalf of a change in our weights and measures, or to sit back in smug satisfaction with America's system of weights and measures, the unsolved cross-word puzzle of the world:

"1. A uniform world-wide system of weights and measures used throughout the world (in place of the present) Metric, the English and the American (Few realize that the English and American systems differ)."

"2. Such a system should be adapted equally to the everyday uses of the people, to their trade and industries, and to science."

"3. There are three major systems of weights and measures used throughout the world, the Metric, the English and the American."

"4. It is urged by some that the United States should abandon its present system and adopt the metric system for general use."

Mr. Roberts continues:

"The problems to be considered are:

"A. Which system is intrinsically superior."

"B. Which system is best adapted to serve the uses of the people of the United States, and to promote their permanent interests."

"C. What difficulties, if any, would a change of the system involve, and how could they best be overcome?"

"D. Is it expedient now to seek legislation designed to effect the early or ultimate accomplishment of a change of systems?"

As a parenthesis, we can mention here that ever since 1866, legislation has been sought before Congress to make the Metric System compulsory. Since 1900 twenty-five proposals have been put before Congress, and three are pending today. So the question "Is it expedient now?" is a peculiar one.

But continuing Mr. Roberts. He follows:

"Summarizing the arguments in favor of the complete adoption of the Metric System we find:

"a. The metric system of weights and measures is now firmly established as an international system, either through its legal adoption, or its exclusive or permissive use for standards, by all the principal nations of the world. Its more general use in the United States is therefore advocated to promote greater international uniformity, and in the hope, if that be accomplished, that Great Britain (the only other country not completely metric) would follow the lead of this country."

"b. The system has been tested and found satisfactory in the United States and elsewhere, in its use in complicated scientific calculations: and, in the metric countries, adaptable to the everyday trade, and to industrial and educational requirements of the people."

"c. While the basis of the units of the metric system is, of course arbitrary, it has now been definitely established, and the various decimal graduations give a wide choice for convenient designated measurements of length, weight and capacity, adaptable to common and scientific use. Familiarity with such terms as the pound and inch is a matter of habit, and it is certain that custom would also make the use of decimal subdivisions of the metric system such as the millimeter, equally familiar and convenient."

"d. The basic simplicity of the sytem, with its few units, as the meter, liter, gram, with decimal subdvisions, makes both teaching and learning easy; and in trade, making computations and billing simple."

"e. An arbitrary imposition of any system of weights and measures without a reasonable period of transition or the principle of exemption, where desirable for manufacture or for export to non-metric ports, might be a hardship. A gradual change has been effected in most countries, and it is believed that such change was accomplished without hardship, and without heavy expense as claimed by those opposed to its adoption. It is also believed that greater uniformity to the habits of metric countries would tend to increase our export trade."

"f. The relative international popularity of the major systems in use is shown by the vast number of nations which have adopted the metric system, while none have formally adopted the English or American systems."

"As further domestic simplicity and international uniformity are believed to be desirable for local convenience and in our foreign trade, and as further adoption by other countries of the English or American systems seems unlikely, it would therefore seem to be an appropriate time to make the change to the metric system. The education of hundreds of thousands of the present generation in the metric system through their overseas experience, and many more in local factory practice growing out of the late war, has laid a broad educational foundation and tended to develop interest in the subject."

"When one considers the proposal to replace our complicated weights and measures with the metric system, there are three distinct impressions received which develop interest, convince the mind, and finally enlist the heart!"

"First, it (the metric system) appears to be scientifically true—a proposal theoretically correct and desirable; then it is seen to be practical and economical—a means of saving much time and money; finally one realizes the moral wrong to children, to workers, to every one and home and to our neighbors—due to the inflicting of an archaic conglomeration of weights and measures upon these people. And with this final realization the demand for reform becomes a crusade!"

The above is the case for the prosecution of our customary units of weight and measure by a prominent metric-system advocate, one who has appeared frequently and presented voluminous

testimony to Committees of Congress considering the proposals before that body to make the System compulsory.

There are many hundreds of such advocates in the United States today presenting the same arguments, and many additional ones, so many that it would require a volume of many hundred pages to present all the testimony in favor of changing over this country to the metric system and abrogating our present units. One such volume was indeed prepared a few years ago, and is conspicuous on the shelves of all the public libraries throughout the country, where it is consulted frequently by thousands of teachers in the public schools, and millions of young people who are assigned tasks of securing data on the subject. This volume is "World Metric Standardization," published by the World Metric Standardization Council, a big red-covered book of over 500 pages.

Much of the "testimony" in this and similar volumes has reached the files of the Committees of Congress in charge of these matters—in the Senate the Committee on Manufacturers; in the House, the Committee on Coinage, Weights and Measures. At any moment, the metric system proposals may again reach the floor of Congress, as "on the Hill" the subject is regarded as a "pending" one which "will have to be threshed out some time, and something done to put it through."

That the United States will some day adopt the metric system as its sole system of weights and measures is now a foregone conclusion in the minds of many millions, which makes the path of the metric-system advocates comparatively easy. And indeed, in the United States today most people, even those who use our customary units as a part of their daily work, are surprised to learn that there are any arguments worth while on the other side.

To demonstrate the reason why the United States should not embrace the metric system of weights and measures is the task of the American Institute of Weights and Measures, which has accepted

(Continued on page 25)

Research and Progress

(Continued from page 15)

pact varies in almost direct proportion with tire inflation pressure. The variation of impact with speed proved to be different for the two types of impacts, drop and shock. The drop impact reached a maximum value at comparatively low speeds and decreased at higher speeds. The shock impact varied almost directly with speed, but did not attain a value as great as the maximum drop impact until a very high speed had been reached.

These bus impact tests are the latest of a series of impact investigations which the bureau has been making for ten years or more. The earlier studies dealt with the measurement of impacts caused by heavily loaded motor trucks, especially those with poor tire equipment.

The recent studies were conducted on a concrete road at Aberdeen (Maryland) Proving Ground, through the courtesy of the Ordnance Department. The vehicle used was a modern high-speed bus chassis with a special body. The floor of the body was divided into small compartments for retaining 100-pound cast-iron weights used to vary the loads.

The tire equipment included both high-pressure pneumatic and balloon types, and the range in size was from 7-inch high-pressure to 12-inch balloon. Inflation varied from 53 to 107 pounds per square inch. Rims were of 20 and 24-inch diameter.

The tests involved two types of obstruction, each 1½ inches high; one an inclined plane 30 inches long, and the other a rectangular obstruction 12 inches wide.

The magnitude of impacts was measured by a multiple-element accelerometer, consisting of ten sensitive elements, which were designed and built by the bureau as a modification of a single element instrument used in earlier impact tests. The accelerometer was mounted on the rear axle of the bus, and was in a position to respond to any vertical accelerations imparted to the axle by the wheel.

—U. S. Department of Agriculture

Electric Balances

Forces on air-craft models in wind tunnels are measured by beam balances, often three or four, operated automatically by small motors attached to the balance beam. The motor screws the movable weight to the left or right according to whether the beam moves downward or upward. There is much sparking at the control-contacts provided at the right hand end of the beam; the inertia carries the traveling weight a little too far and several adjustments are necessary each time. The remedy is to use a vacuum tube control. A UX-250 vacuum tube is ample to operate the small 1/200 hp. 110 volt motors used on the balances. Closing one of the mechanical contacts impresses a positive voltage on the grid of one of the tubes and allows current to pass between the plate and filament. The motor responds instantly to the slightest pressure and the sensitivity of the balance is increased.

—Electronics.

Campus Activities

(Continued from page 13)

enumerated some of the important rules, concerning absences, tardiness, and deportment. President Prentice mentioned the improvements which have been completed during the summer, among which are a new lecture room which is provided with an excellent ventilation system, the Junior class present of new mirrors in the wash rooms, and walls in the rooms newly painted. Professor Hutchins, as chairman of the athletic committee, told of a new plan for the football season, that of selling season tickets to the general public.

A special assembly was held on September 22, so that the students could hear Dr. Paul Luckenbach's most interesting speech on ultra violet radiations. He showed a series of slides which were impressive proofs of his statements.

HUMOR

Richard K. Toner

Prof: Will you men please stop exchanging notes in the back of the room?

Student: Them ain't notes. Them's dollar bills. We're shooting craps.

Prof: Oh, pardon me.

—Texas Longhorn.

Detective: I had a hard case last week.

Friend: What was it?

Detective: Well a man was shot. The knife was found by his side. Who do you think poisoned him?

Friend: Who?

Detective: Nobody. He hanged himself.—Temple Owl.

Voices in the dead of night in the dorm:

"Wake up, quick, wake up!"

"Can't."

"Why not?"

"Ain't sleeping."

—Northwestern Purple Parrot.

College is largely a matter of give and take. Give money and take examinations.

—Boston Beanpot.

Timid woman (about to buy ticket for Europe): And is the boat that sails on Thursday perfectly safe?

Agent (gravely): Madam, I assure you that in all the time this ship has been in service, and that covers a number of years, not once has she gone to the bottom.

Woman: Oh, then, it must be all right. Let me have a cabin, please.—Idaho Blue Bucket.

And as Sandy, our Scotch friend, said: "Lend me ninety-five cents, will ya? I don't want to break a dollar."

—Pennsylvania Punch Bowl.

Baby: And I'm the first girl you've ever kissed?

Senior: Now that you've mentioned it, you do look familiar.

We call our Math Prof "North Pole" 'cause no one ever passes under him.

"You know, Henrietta, every time I see you my heart beats faster. I feel the urge to do bigger and better things. I feel so strong and virile. Do you know what that means?

"Sure, it means that in about five minutes you and I are going to have a wrestling match."

—Ohio State Sun Dial.

Both: Silence.

He: Is it all over?

She: No—just a little on your shoulder.

—Pennsylvania Punch Bowl.

Then there was the young lady who went horseback riding with her boy friend and got sore and walked back.

An insurance company wrote out a $1000 life insurance policy in the name of Samuel Smith. Premiums were paid promptly for a few years, but suddenly stopped. After sending a few delinquent notices, the company received the reply:

"Dear Sirs: Please excuse us as we can't pay any more premiums on Sam. He died last May. Yours truly, Mrs. Smith."

—Christian Register.

Lady: Are you a doctor?

Drug Clerk: No. ma'm. I'm a fizzician.

—Western Reserve Red Cat.

"Are you a union man?"

"Yes, and I work sixteen hours a day."

"I thought union men worked only eight hours a day."

"They do, but you see I belong to two unions!"

—Ohio State Sun Dial.

Prof: There are at least two sides to everything.

Student: Sir, have you ever seen a girl's bathing suit?

—Pitt Panther.

A tiny dog was running rapidly across the desert. Lickety-split, he went, lickety-split. As he passed the Sphinx, the stone lips opened and the Sphinx asked: "Little dog, why do you run so fast? There is nothing to hurry about on this vast expanse of sand."

But the little dog continued running. Lickety-split, he went, lickety-split. But as the Sphinx spoke again, the little dog turned his innocent head, and said, "Oh, me, Oh my, what a long distance between trees on this street." And he continued, lickety-split, lickety-split.—Pitt Panther.

College bred is made of the flower of youth and dad's dough.

Alumni News

(Continued from page 12)

'23 H. J. McDargh, Jr., represented Rose at the Centennial Celebration at Dennison University on Friday, October 16, 1931.

Herman H. Heck has a brother, Louis, who is a freshman at Rose.

Richard W. Hager '23 with the International General Electric Co. expects to go to Manila in May as assistant to the general manager.

'24 Harold B. Hood '24 has been admitted to the firm of Hood & Hahn, attorneys and counselors in patent and trade mark causes, Indianapolis.

'25 Edward F. Rickelman has a brother, Harry J., who is in the freshman year at Rose.

Edward G. Gray has a brother, Clement, who has entered Rose this fall.

'26 Frank Swearingen '26 is with the Engineering and Inspection Division of the Travelers Insurance Co., with headquarters at Louisville, Kentucky.

'28 Robert F. Alexander with the Pennsylvania Railroad has been transferred to Havre de Grace, Maryland.

J. Rex Adams is with the Old Colony Envelope Co., Westfield, Mass.

Valentine J. Mitch is studying law at the George Washington University and working as field engineer on the Arlington Memorial bridge across the Potomac River.

Andrew J. Nehf is with the Illinois State Highway Commission with headquarters at Elgin, Ill.

Thomas M. Reed has a brother, William M., who has entered the ranks of the Rose freshmen.

J. Leonard Montgomery now has two brothers in Rose. John is in the senior class, and Paul is in the freshman.

'29 Raymond P. Harris was married to Miss Mary Baur of Terre Haute on June 30, 1931. Mr. Harris is with the Dorr Co. Inc., New York, N. Y.

A. Wayne Dicks was married to Miss Margaret Enola Bear of Terre Haute on June 2, 1931. Mr. Dicks is engineer assistant at the Michigan Bell Telephone Co., Detroit, Mich.

'30 James H. Corp was married to Miss Evelyn Pauncer Rummich of Bakersfield, California on Sept. 11, 1931. Mr. Corp is with the Michigan Bell Telephone Co., Detroit. They will make their home at 11892 Ohio Street, Apartment 201. Detroit.

Andrew H. Davey has accepted a position with the Quaker Maid Co., Terre Haute.

Theodore S. Cliff has a brother William who has entered Rose.

'31 Anthony G. Blake is working on his master's degree at the Massachussetts Institute of Technology. His address while in Boston is 66 Bay State Road.

Kenneth Mason is now working for the Quaker Maid Co., Terre Haute, Ind.

Wooley Ex-31, is attending the University of Alabama.

The Metric System Controversy

(Continued from page 21)

the responsibility of maintaining our customary units inviolate.

We may not be able to prove that such units as we are using in building the most up to the minute machinery and apparatus did not originate in antiquity, but we can show that though the inch was used by the Egyptians in building the pyramids, the pyramids were not built to an accuracy of a ten thousandth part of an inch, as is say an automobile today. And we shall also be able to show that if the United States does adopt the metric system, the inch will have to be superseded by the millimeter; and this will be unfortunate, as an inch is an infinitely more convenient basic unit than is a millimeter, which is about a twenty-fifth part of an inch.

Also, we hope to be able to show, that in spite of all appearances and opinions, the use of the metric system in the world is declining. The system has passed its zenith. Consequently, it would be a mistake for the United States and Great Britain to insert it in their numerous weights and measures laws, in place of our customary units which hold full sway there. And, holding this opinion, we may say that the persistent and powerful attempts to force the metric system on the people of the United States have as their primary purpose the saving of the system before it is too late. For, unless the United States and Great Britain do adopt the metric system officially, in our opinion it will in time lose completely its position in the world, and be replaced by a system based on our customary units and units derived from them.

Artificial Weather in Express Trains

A leading railroad has recently installed air-conditioning equipment on two of its crack trains. Although the science of artifically creating ideal air conditions has been developed rapidly for buildings, this latest application seems particularly advantageous. Not only does it insure proper ventilation, temperature, and humidity in every car, but it also eliminates most of the noise, smoke, and cinders incident to ordinary rail travel, by doing away with open windows.

Each car is equipped with a separate air-conditioning unit which draws used air into the blower, mixes it with fresh air, gives it the proper humidity, cools (or heats) it, and forces it into the car. Thermostats maintain a temperature of about 70°. To insure proper operation of the system, the windows are kept sealed.

So successful has the project been that two more trains are soon to be equipped.

Engineering News

Sports

◆

Campus Activities

Fraternities

◆

Alumni Notes

MEN OF ROSE

— ***Remember our Rose Spirit*** —

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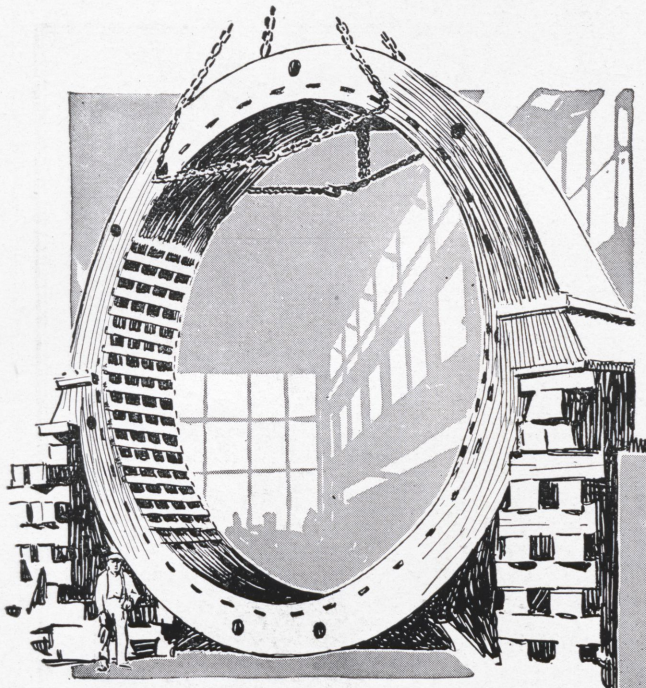
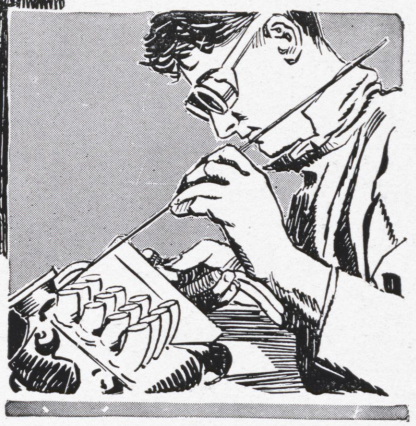
THE ROSE TECHNIC



IN DESIGN OR REDESIGN

LINDE PROCESS SERVICE ASSURES YOU EVERY ADVANTAGE OF OXWELDING AND CUTTING



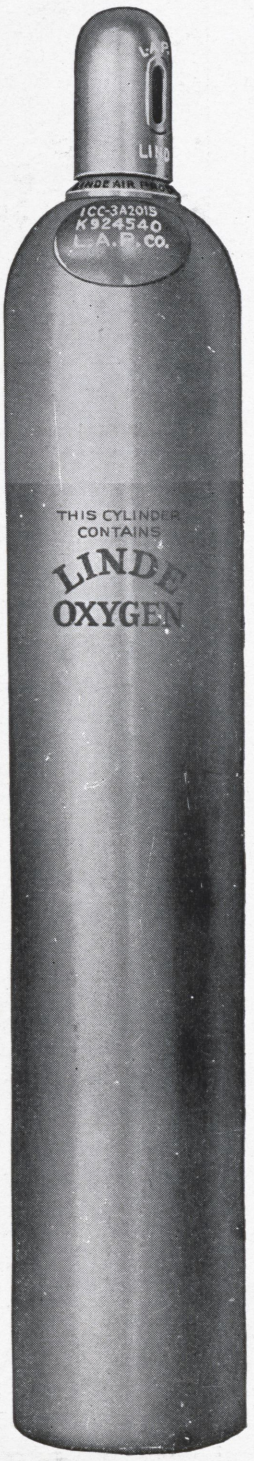
IN planning a new metal product or improving an old one, Linde Process Service places at the disposal of Linde users an unparalleled knowledge of the oxy-acetylene process of welding and cutting. This service effectively supplements the work of your own engineers in obtaining maximum design advantages, production economies, and complete dependability. Typical examples of Linde Process Service include—

Assistance to a manufacturer in remaking a broken cast iron generator yoke on an urgently fast schedule. This unit was redesigned for fabrication from oxy-acetylene shape-cut steel by welding.

Cooperation with another manufacturer in designing for welded production a steel forming press. Dependability was achieved at exceptionally low cost through the use of oxy-acetylene shape-cut steel.

Helping an aircraft builder design a "hot spot" for fuel heating. The necessary compactness of this device could be obtained only by oxwelding. Lightness without sacrifice of strength was essential.

Tomorrow's engineers will be expected to know how to apply the oxy-acetylene process of welding and cutting metals. For their assistance, we have prepared several interesting technical booklets explaining how this modern metal-working process is used in the design, construction, and fabrication of metal parts and structures. These books contain newer and more practical material than most texts and will form a helpful addition to your personal library. Write to us and we will send them to you without charge.



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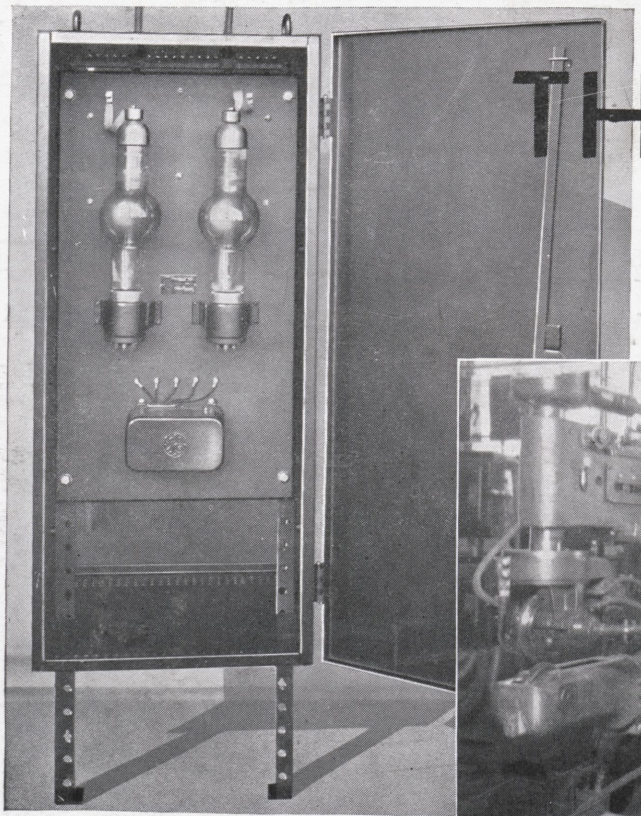
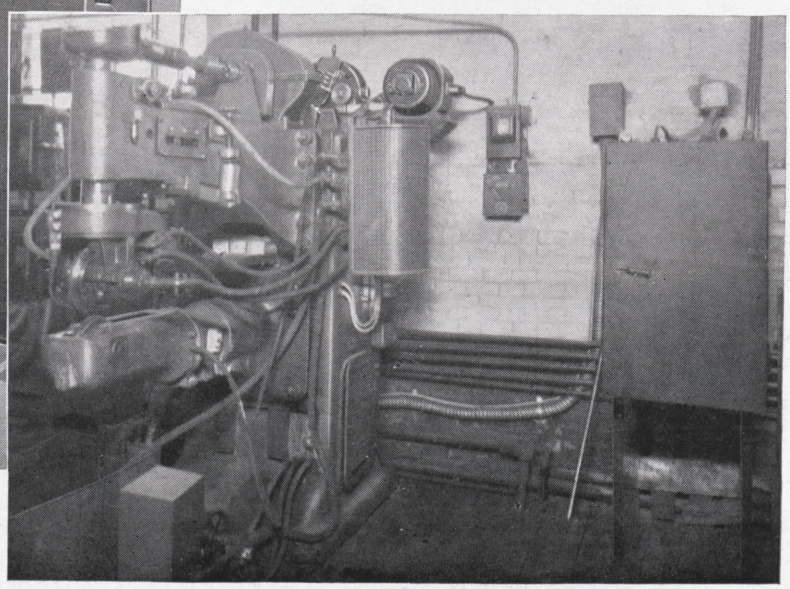
THYRATRON

THE OPEN DOOR



Close-up of a Thyratron control panel for high-speed welding applications



G-E Thyratron control equipment (in case) operates this line welder through a reactor

THE new electron tube, the Thyratron, is the most versatile servant developed in recent years. Already it has a host of applications. It will open windows, count anything that will interrupt a beam of light, operate welding machines, sort beans or buttons, operate drinking fountains as you bend over them, light buildings, windows, and theaters, and measure the intense heat of furnace interiors. And it has a thousand other applications.

Thyratron control has made possible high-speed welding machines, for no contactor-actuated resistance welder can approach the speed of several hundred interruptions per minute that are required. High-current Thyratrons interrupt the current in the welding transformers and swing the impedance from high to low, the welding rate depending on the speed of these changes. Thyratron control can be used for as many as one thousand interruptions per minute.

The name Thyratron comes from a Greek word which means "door". Not only does this tube act as a door, or valve, for electricity, but some scientists say that its possibilities are so great that its use will revolutionize the electrical industry. If these predictions are correct, the Thyratron is an open door of opportunity for young men now in college and for graduates already in the employ of the General Electric Company.

95-883DH

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SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES