

Spring 4-1905

## Volume 14 - Issue 7 - April, 1905

Rose Technic Staff

*Rose-Hulman Institute of Technology*

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### Recommended Citation

Staff, Rose Technic, "Volume 14 - Issue 7 - April, 1905" (1905). *Technic*. 253.  
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VOL. XIV.

TERRE HAUTE, IND., APRIL, 1905.

No. 7

## THE TECHNIC.

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One Year, \$1.00. Single Copy, 15 cents.

*Issued Monthly at the Rose Polytechnic Institute.*

Entered at the Post Office, Terre Haute, Indiana, as second-class mail matter.

A SENIOR trip has been decided upon for the class of 1905 although the place is as yet in doubt. The time set for the trip is about the middle week of April. Many places have been considered, but the choice seems to rest between Louisville and Chicago, with Louisville a little in the lead. In both of these cities Rose is well represented by alumni. In Louisville they have a Rose Tech Club, while in Chicago they are unorganized. A committee from the Senior class, together with alumni in the city chosen, will arrange an itinerary for a trip to last about four days. This will include inspection work for Electricals, Mechanicals, Civils and Chemists. The principal object of the trip is to give the students a glimpse into shop arrangement and management; to get an idea of how things are done in large works.

THE Glee Club has made two distinct hits during the past month—in this city and in Paris, Ill. Of all the organizations of the Institute, more profit and pleasure, and events to be remembered after we leave old Rose, are gained from connection with the Glee Club than with any other. Of course, our athletes stand forth in bold prominence and pass down in school history as heroes to be admired, but eventually we forget them; but these weekly meetings of the Glee Club will make impressions that no time will efface. A contemporary has written that the best advertisement a college can have is a good glee club. As far as this source of advertisement is concerned, Rose need have no fear, for she has a glee club that is on a par with the best.

DURING the foot-ball season our police force, organized from the Juniors to keep our fence patrons in order, did efficient service. A similar service is required for the base-ball season, and if the same fellows would take the matter in hand, order would be assured.

THE TECHNIC is indebted to the Nordyke, Marmon Co., of Indianapolis, for the halftones appearing in Mr. Hood's article.

THESIS work has begun for the Seniors. As each man has chosen his own subject for investigation, all are interested in the work in hand. Eight weeks are allowed for the completion of the work, at the end of which time each will be called on to stand an examination on his subject. The success of this work rests entirely with the

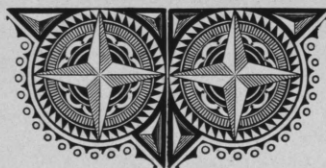
individual. If he has worked faithfully, good results are sure to follow.

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THERE is an old saying, so old, in fact, that even the men who claim to have had a grandfather who knew the man who originated it have long since been forgotten. The saying is that "There is nothing sure but death and taxes." Now, linked with this pair there appears another, new, but with such an amount of determination already exhibited, and supported by a statement of the committee behind it, that it is a fit climax for the completion of the trio. This new link is the "everlasting persistence of the Endowment Committee. So they stand

Death, Taxes and the Committee's persistence, supreme in their "sticktoitiveness," based on truth, supported by conviction to right, and stayed for all time by the rigid examples behind them.

In the February issue of THE TECHNIC there appeared, an account of what had been done and what had yet to be done. Many came when called, but others are yet to be heard from. If the success of the enterprise is to be as sweeping as the ambition of the committee has pictured it, it will be necessary for each alumnus to give the matter careful consideration. Think this over, alumni, and when you've made up your mind kindly advise us of your intention.







IN the early days of automobile design, there seemed to be a common impression that the commercial production of an automobile consisted merely in mounting any sort of a motor upon an ordinary framework supported by four wheels, and apparently the only recognized essential was the mounting of the front wheels on stud axles instead of upon a single axle such as is common in ordinary vehicles. As a result there were, and still are, a large number of "freak" machines on the market, and they have been and are no end of trouble to users.

A year ago I took the trouble to visit the automobile show at Chicago and there inspected almost all of the different makes of machines, and I was considerably surprised to find that, with but a few notable exceptions, every car had, somewhere in it, some glaring mechanical blunder which indicated that the design of the machine was the result of "jumping at conclusions."

One of the most common constructions, which appeared to me to be a glaring error, was the arrangement of a multi-cylinder engine with its crank shaft axis parallel to the line of motion, and also parallel with the ground, so that, when a bevel gear drive was used it was necessary to drop down from the rear end of the engine shaft to the rear axle by means of a short section of shaft inclining rearwardly and down-

wardly at an angle of about fifteen degrees to the horizontal. This short inclined shaft was connected to the engine shaft by means of a cardan joint. Sometimes a similar joint was placed between the short inclined shaft and the short stud shaft of the bevel pinion. The engine was then mounted on the main frame of the chassis, and of course the rear or drive axle carried springs which supported the rear end of the frame. Every vibration of the frame and rear axle, therefore, tended to straighten the angle formed between the engine shaft and the short inclined shaft so that there was a continual end thrust produced on both shafts, and, as all power had to be transmitted through the cardan joint between the two shafts, and the shafts were never in alignment, the loss of power was very great indeed and the joint was a point of extreme weakness.

A great many attempts have been made to provide a motor support permitting a connection be-

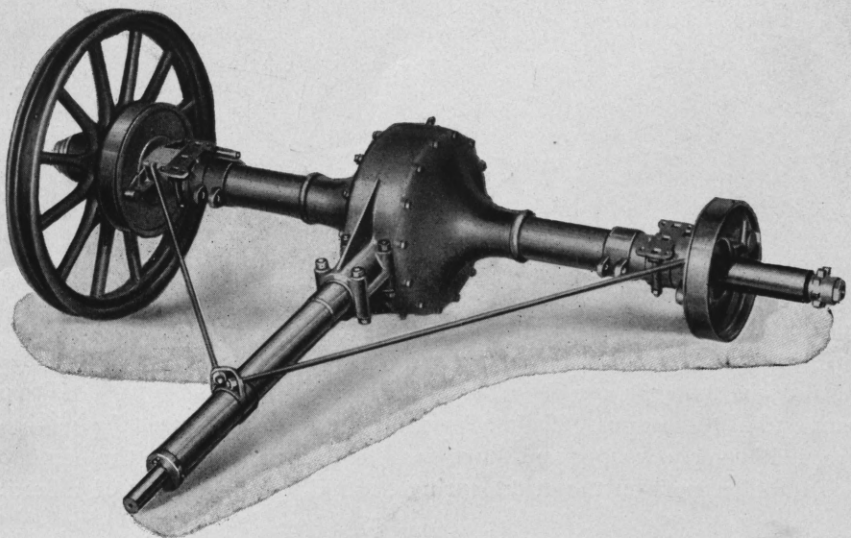


FIG. 1.



tween the engine and the drive axle which would be flexible without loss of power, but so far as I know each attempt has been lacking in some feature.

The accompanying cuts illustrate a very ingenious solution of the problem, and I am of the opinion that it reaches complete success. Fig. 1 illustrates the rear axle structure, the principal characteristic of which is the forwardly extend-

ing sleeve which is rigidly connected to the hollow axle structure and within which the bevel pinion shaft is journaled. The forward end of this shaft is shown protruding from the hollow sleeve. This hollow sleeve serves as a pivotal bearing for the rear end of a substantially triangular motor-supporting frame which is shown underneath the main frame in Fig. 2. This motor-supporting frame is supported at its

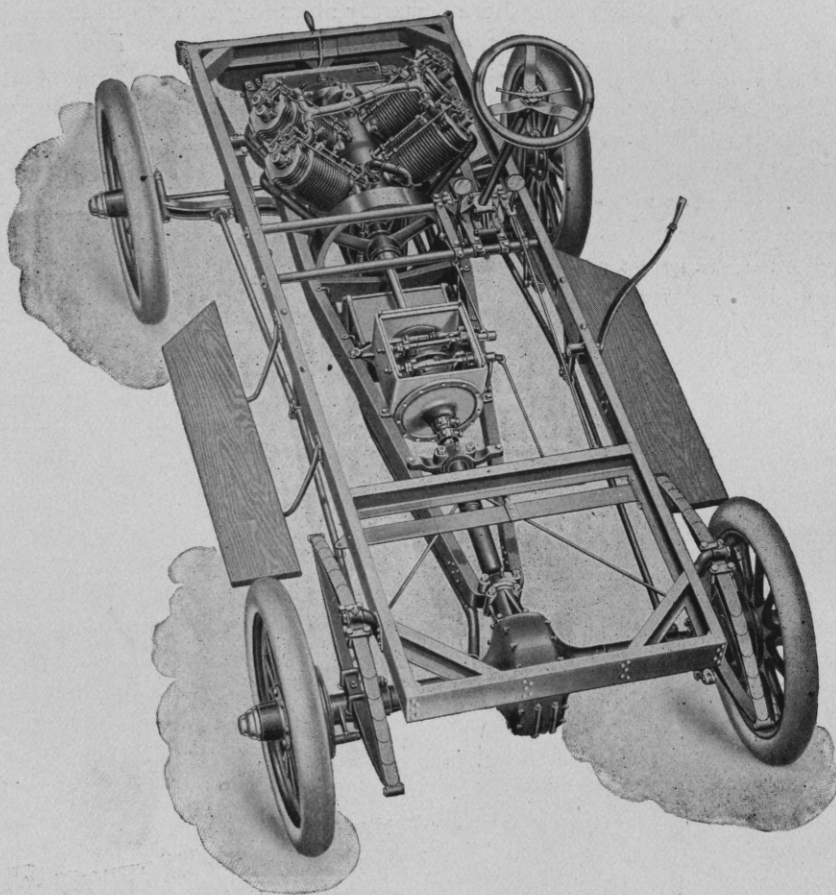


FIG. 2.

front end on a transverse pivotal axis on the two-leaf springs carried by the front axle (see Fig. 3), and the motor is rigidly attached to the forward end of this frame. The motor frame, therefore, inclines rearwardly and downwardly, from its line of support on the front springs, radially

toward the rear axle structure, and is pivoted upon a longitudinal axis on a forwardly projecting sleeve of the rear axle structure. As a consequence, the engine shaft may be directly connected to the bevel pinion shaft without the interposition of a flexible connection of any kind,

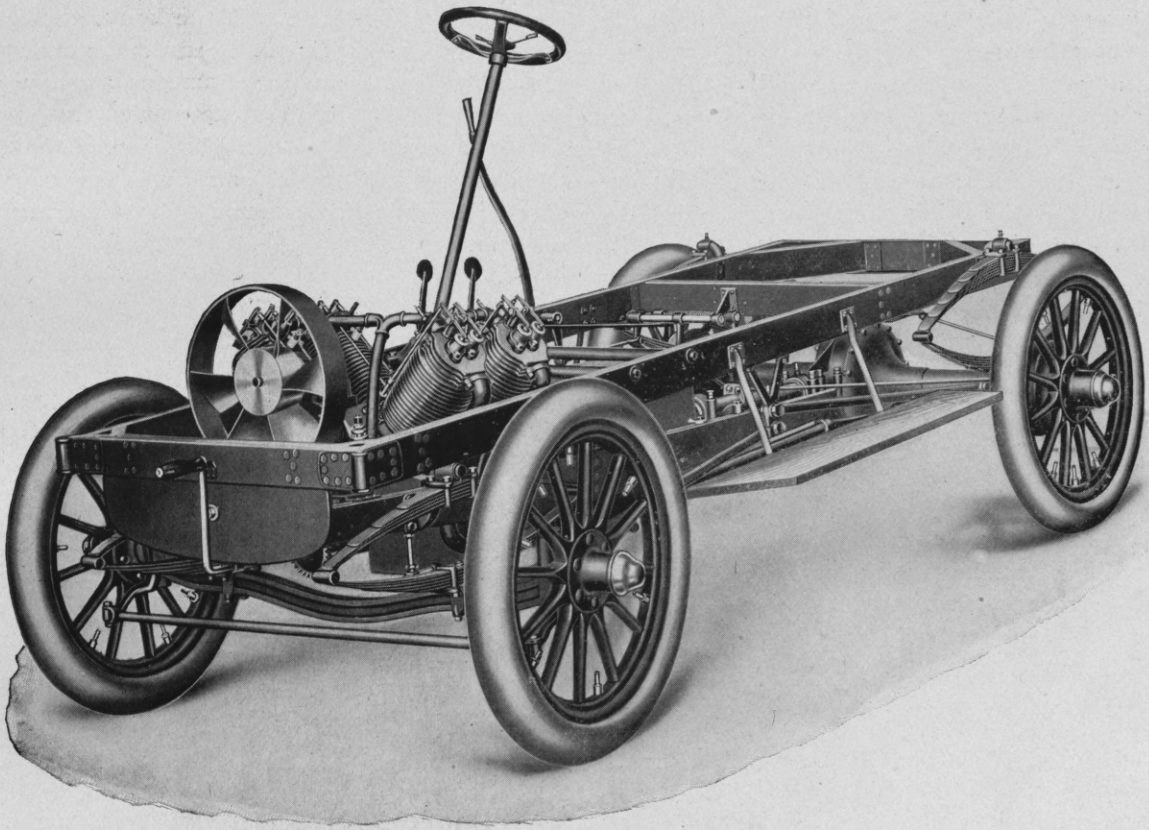


FIG. 3.

and in the structure shown in the illustrations the engine shaft is in direct alignment with and rigidly attached to the pinion shaft. As a result of this arrangement either axle may be swung in a vertical plane without any possibility of racking or twisting the driving connection between the engine and the drive axle.

This arrangement insures complete flexibility, so far as the driving connections are concerned, but in order to permit very decided vertical displacement of either axle without disturbing the horizontal position of the carriage body, the carriage body frame (the square frame shown in Fig. 2) has its rear end supported upon a horizontal pivotal line on the springs of the rear axle structure, while its front end is supported by means of a single horizontal longitudinal pivot

which can be seen in Fig. 2 almost directly beneath the handle of the starting lever which is shown at the extreme top of the view.

This construction gives what has been aptly called "double three-point suspension," and as a result of this construction there is practically no angular displacement of carriage body. It is possible, for instance, to raise any wheel as much as eighteen inches from the floor, (as illustrated in Fig. 4) without displacing the body from the horizontal and without in any manner twisting or straining the connection between the engine and the rear axle.

Any vertical vibration of the rear axle, as a whole, is permitted by reason of the transverse pivotal support of the engine frame on the front springs and a similar bodily vertical vibration of

the front axle is taken care of by the similar transverse pivotal support of the upper or body frame on the rear springs.

Any vertical displacement of *either end* of the rear axle structure causes the forwardly projecting sleeve carried thereby to turn in its bearing in the apex of the motor frame, one spring expanded and the other compressed so that the motor frame is not displaced except to have its rear end slightly raised, but this without racking

the driving connection. Similarly, a vertical displacement of either end of the front axle compresses one front spring and permits the other to expand while the engine frame as a whole is turned on the longitudinal sleeve as an axis.

The illustrations are furnished by courtesy of the Nordyke & Marmon Company, of Indianapolis, which is placing a machine of this kind on the market.

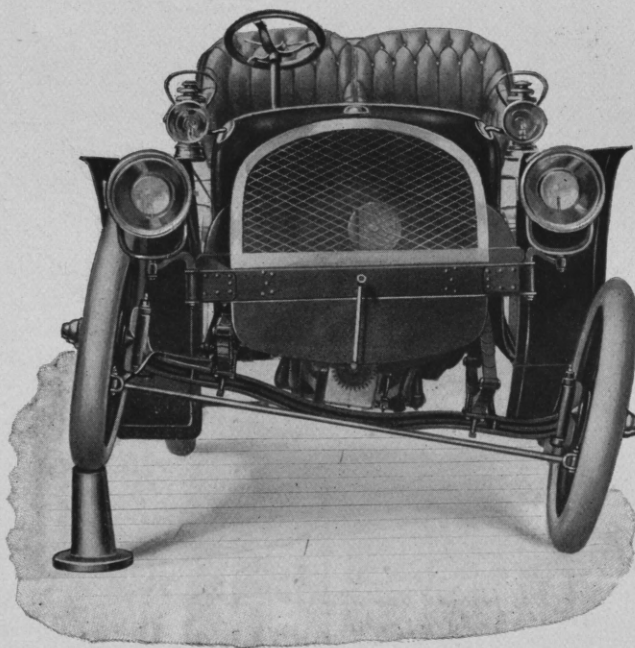


FIG. 4.





## Development of the Modern Switchboard.

By R. E. HUTHSTEINER.

IN the early days of electric power station design, a switchboard was seldom thought of. In fact, as a rule even after the need of disconnecting the circuits was given attention and consideration the result was hardly what we would call a switchboard, but simply a few necessary switches mounted somewhere in the station. This haphazard practice caused delays in completing the installation which often proved serious and expensive, and the failure to provide sufficient space for making suitable switching connections greatly increased the danger from fire.

The switching devices were looked upon at this period as one of the necessary evils and as only semi-justifiable items of expense required in equipping an electrical power station, and usually no attempt was made to determine what they should consist of until installation was well under way. The practice was to locate the machinery and then look around for "a place to put in some switches." Later, specifications for machine builders began to contain the clause: "Necessary switching apparatus should be included." This clause was intended to secure for the purchaser a satisfactory and effective switch-system without further effort or worry by the Consulting Engineers, in whose minds there probably

never was any definite idea of what should be furnished. The Consulting Engineers usually preferred to criticise what was supplied rather than specify in advance what should be furnished. Even after some of the large electrical manufacturing companies settled on standard practice and took up the work of standardization of switchboards, to insure more definite consideration when the contract was being drawn up, the switchboard was frequently given as a sort of bonus to go with the machinery.

As electrical engineering advanced and larger installations were undertaken, stations were built in which each unit had many times the capacity of an entire station of earlier days. The great increase in station outputs, and especially the introduction of high voltages, rendered it more and more necessary to give the switchboard design and equipment very careful consideration. The need of thorough reliability to insure continuity of service of the station and safety to the operator began to be recognized. The proportional outlay for the switchboard increased until it became one of the principal items in the contract for power station equipment. In large stations the switching devices, etc., constituted such an important part of the equipment that it was

found advisable to make them the basis of a separate contract instead of including them in the general contract for the machinery. This process of the development has steadily continued, until today it is not infrequent for the generating apparatus contract to be awarded to one bidder and the contract for the switches and switchboards to another.

The increase in the size of units and the use of higher voltages made it necessary to develop switches, circuit breakers, rheostats, etc., of a larger capacity, until in some cases they could no longer be mounted on the switchboard. This increase in size, together with the very large number of feeders to be controlled, forced the use of "remote controlled" apparatus which permits placing the switches, circuit breakers, etc., in the most convenient place to suit the station wiring. The use of remote controlled apparatus made it possible to obtain the best and most simple arrangement of station wiring and at the same time permitted concentration of control of the en-

tire station on a comparatively small and convenient tablet. (See Fig. 1: Controlling Board in Generating Station of Metropolitan St. Ry., N. Y.) With this method of control the switchboard attendant needs to take but one or two steps, even in a very large station, to reach the controlling switch for any of the apparatus in the station, even to the shutting down of the prime mover.

As a further means of avoiding accidental short circuits, direct current switchboards for control of railway generating stations and exciter switchboards for large alternating current generating stations are made with single-pole switches having bus bars of only one polarity mounted on them, the other pole being mounted elsewhere in the station.

It is also found advisable not only to increase the actual safety of the operator, but to arrange the apparatus so as to inspire a feeling of confidence and security from harm, as an excited operator's mistake in a large station might result in expensive accident, interruption of service, and in some cases loss of life. The safety of the operator, therefore, is given most careful consideration, and frequently is given first consideration, with consequent increase in first cost of the station.

The tendency now in designing high potential alternating current installations is to go a step farther to obtain additional protection against fire, etc., by placing the switches and circuit breakers in a special room separated from the machinery room by a brick wall, or even in an entirely separate building.

The present practice in large installations is to lay out the station or engine room practically independent of the switchboard gallery or switchhouse, the switching arrangement being given separate and independent thought and no longer subject to liability of distortion or inconvenience of rearrangement of the machinery in arriving at the final layout of the station.

In switchboard design the following should receive special and careful consideration:

- (a) Bus bars should be separated as much as

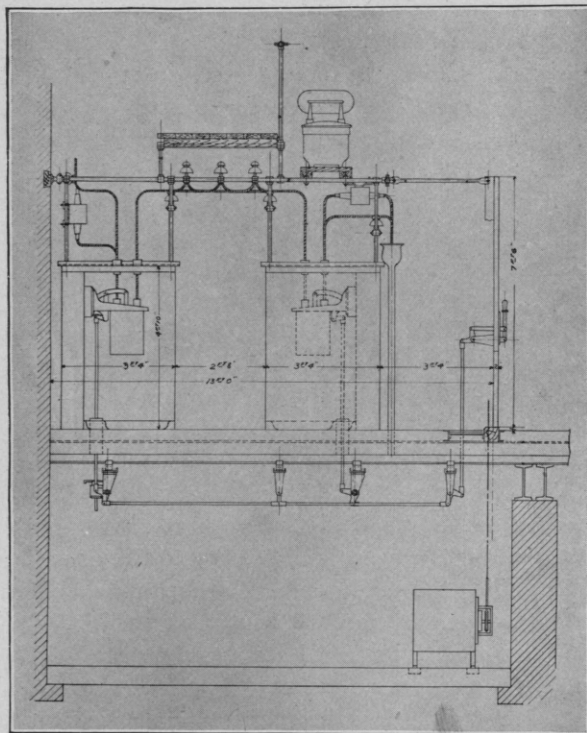


FIG. 1. Typical 1300 volt, 3-phase arrangement for Railway Power Station.



practicable, and when possible, isolating barriers should be used to reduce to a minimum the possibility of accident to the bus bars, for the reason that any trouble with these involves the entire station. They are quite frequently separated by either soapstone or marble barriers or by brick

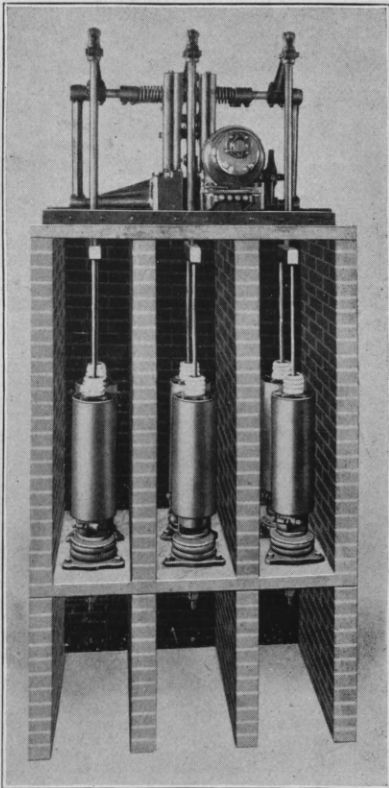


FIG. 2. Type FE, Form H-3, Oil Switch.

partitions. Fig. 2 shows a section through a standard 13,000 volt switchboard arrangement, showing bus bars, oil switches in cells, etc.

(b) All terminals and unprotected live parts should be thoroughly isolated to avoid spreading of trouble and to confine it if possible to its origin. This construction will localize the trouble and prevent it from becoming general, as illustrated in Fig. 4.

Fig. 3 shows standard air break switch as used on 250 volt circuits for control of 500 Kw. lighting generator, which up to about 1892 was the largest machine in use. At this time the ma-

chines for the Chicago World's Fair were designed.

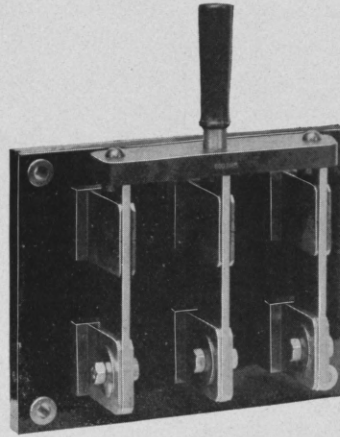


FIG. 3.

Fig. 2 shows standard oil break switch as used for control of 13,000 volt, 5,000 Kw. generator, such as are employed in generating stations of 30,000 to 50,000 Kw. capacity.

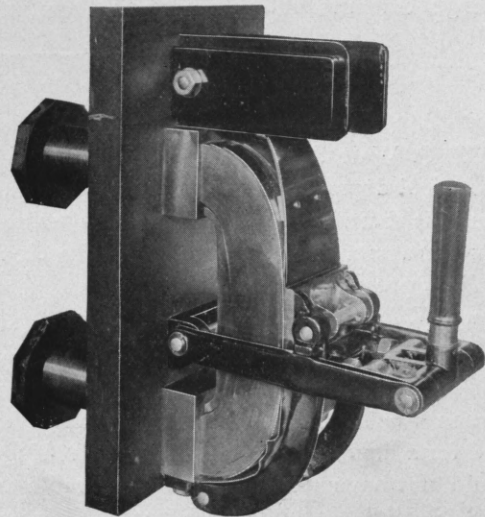


FIG. 4. S. P. S. T. 6000 Amp. Toggle Brush Switch.

Fig. 4 shows a large capacity low voltage switch, 6,000 amps., 600 volts. Switches of this type have been built single-pole for 12,000 amperes, either hand or motor operated, and for single, double and triple throw.

(c) Ample clearance between all parts of op-



posite polarity and ground should be insisted upon.

(d) Specifications should require that all apparatus must carry full load without excessive heating, instead of stipulating limits of current density.

A statement regarding the heating is undoubtedly a better indication of the quality and workmanship of a device than one giving current density. Inferior apparatus may be designed in which the current density is very low, yet, which when operated on only normal or rated load, will show excessive heating. Furthermore, a current density suitable for low capacity direct current apparatus will show very much greater heating when used for larger capacities. Again, apparatus which shows practically no heating on normal direct current may become excessively heated when carrying alternating current equal to direct current rating.

In the development of electrical apparatus it was found less difficult to generate high voltages and large currents than to control them, and

switchboards and switching apparatus have, therefore, developed until today the term switchboard hardly has the same meaning it had a few years ago except for small installations. In England the term "switch gear" has been used to supersede the word "switchboard." Under the term "switchboard," the necessary apparatus is developed for the control of circuits of any voltage or capacity, whether it be a single panel for the control of small lighting generator with few or no feeders, or the necessary apparatus for the control of a generating station of many thousand horse power.

The subject of this article, "Modern Switchboards," is one on which a much longer and much more interesting article might be written, advantageously sub-divided into at least two parts, namely: Alternating Current Switchboards and Direct Current Switchboards. In the present article, however, it was the intention to avoid details and to confine the remarks to such points as had a direct bearing on shaping or deciding switchboard practice.

#### ALUMNI NOTES.

Mr. S. S. Wales, Rose '91, formerly head of the electrical department of the Homestead Steel Works, has recently been promoted superintendent of the armor plate department. The *Homestead Press* presents the following:

"The Armor plate department is one of the hardest to manage because of the fact that a great deal of secrecy is maintained in that department, and when the superintendent of the mills here wished for a man to take the place of Mr. Unger, he could not have secured a more desirable man than S. S. Wales, who was chosen. There will be a great surprise among steel men when it is known that Wales has been chosen. His field is electricity and in that field, he has attained eminent success, but few knew that Mr. Wales was more than ordinarily versed in the process of steel manufacture. However, one steel worker described the situation exactly last evening,

while talking of the promotions. Some one remarked that they did not know that Mr. Wales knew anything of the manufacture of armor plate, to which the above mentioned replied: 'Wales knows a lot more about other things than electricity than you would think, even if you knew him intimately.' Mr. Wales has the respect of every man in the Homestead steel works, and a more faithful man to his duties could scarcely be found for the difficult position that he occupies tomorrow.

The many friends of Mr. Offutt Mundy were shocked to hear of his death on March 29th. THE TECHNIC extends heartfelt sympathy to the bereaved family. The following is a clipping from the *Louisville Post*:

"Offutt Mundy, one of the most promising young engineers in the country, died in Pittsburgh, March 29, 1905. Death resulted from a severe cold contracted several months ago, which

settled in his ear and caused an abscess to form. An operation was performed and then a second one, but of no avail.

"Immediately after his graduation from the Rose Polytechnic in 1895, he entered the City Railway shops on Eighteenth street and in a few months had worked up to the position of superintendent and was then appointed superintendent of the power house, which position he held for two years.

"He then went with the General Electric Company, of Schenectady, N. Y., in a responsible position. He, with another young man, devised the multiple unit system, which is now almost universally used in New York, and is being used generally elsewhere. For this device he achieved an enviable reputation in electrical circles before he was thirty years old. He patented other devices which are in general use in electric cars.

"For over two years Mr. Mundy was superintendent of the St. Louis Transit Company shops and last April became commercial engineer for the Westinghouse Electric and Manufacturing Company, of Pittsburg, the position having been created especially for him.

"He was married January 4th of this year, his wife being Miss Kathleen Eddy, of Detroit."

The funeral took place March 31st from the residence of his parents.

A letter from Mr. Mundy to Dr. Mees, written

March 7th, while it is bright and cheerful, is yet sad in view of the eventual outcome only a few weeks later. He says:

"My Dear Doctor,

"Please excuse the delay in reply to yours of Feb. 16. I am just out of the hospital to-day, and also had my first mail to-day, your letter being in the bunch.

"My present position is 'Commercial Engineer of the Westinghouse Electric and Manufacturing Co.,' East Pittsburg. I trust to be able to arrange it so as to be present at the commencement in June, and hope to have the pleasure of seeing you then. Have had quite a time of it for six weeks with my left ear, and ten days ago had an inch and a half of the mastoid bone cut out. Hope to soon be back at my work.

Very truly yours, W. O. MUNDY.

"By W. H. MUNDY, Amanuensis."

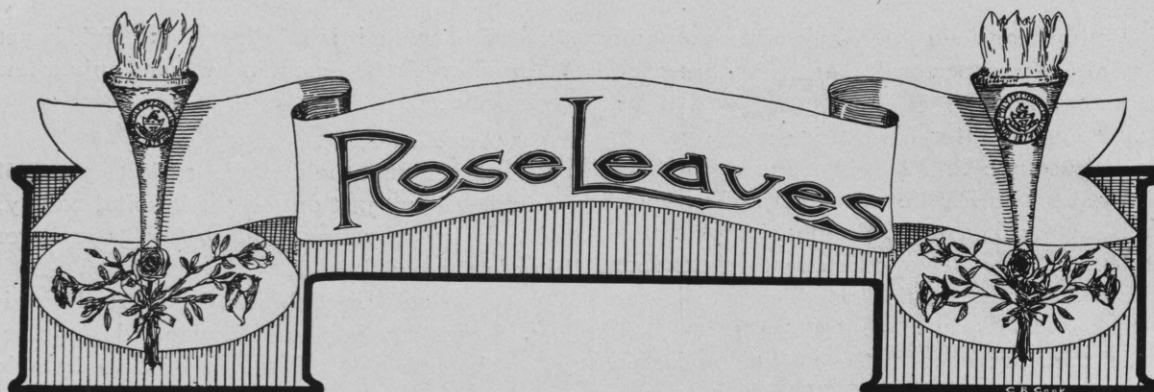
Wallace D. Bowie, '03, is with the Southern Pacific Ry. on a survey from Durango, Colo., to Globe, Arizona.

John T. Dickerson, '02, is Assistant Engineer of the Scherzer Rolling Lift Bridge Co., 1616 Monadnock Bldg., Chicago.

Kimbrough E. Voorhes, '98, is now with the Henry R. Worthington Works, Centrifugal Pump Department, Harrison, New Jersey.







## India Rubber—Its Production and Uses.

By A. D'AMORIM, '06.

WHETHER under the name "Seringa," according to Father Esperanca, on account of the rough manufacture by the Indians, of water pots and other vessels or under the names of "Caucho" (from the Omagua dialect Cahuchu) attributed to LaCondamine, the fact remains that amongst all the varieties of trees, palms, creepers and vines producing a sap or vegetable milk, nothing is to be found equal to the "Heavea Amazonica" and the "Symphonia Cahuchu" or "Guyanensis" for elasticity and strength, according to analyses and experiments made, comparing it with similar products from Africa, India, Australia, Central and South America.

It, as yet, stands alone without a rival or competitor in the different departments where it is in daily use.

The rubber tree proper or "Seringueira," the "Heavea Amazonica" or "Symphonia Braziliensis" of the "Euphorbeaceas" family, grows from 10 to 20 meters (from 12 to 24.5 feet) high and from 1 to 2 meters (36 ins. to 72¾ ins.) in diameter. It is seldom used for building purposes. The sap, which by the process of artificial condensation becomes glutinous, is extracted from the tree in two different ways: By means of the *arrocho*, now condemned on account of the trees seldom surviving this process, and the usual method now employed being to make incisions. The "Arrocho" method consists in binding the

trees with a vine and making incisions above it with a small hatchet, the sap then runs out in strings and bleeds the tree, which seldom survives this treatment.

This process has since been abolished and now, if any gatherer is found collecting the sap in this manner, he is made responsible for the damage and dismissed.

The present system consists in making incisions an inch long and as deep as the bark, with a small hatchet, no binding is used, and the incisions are only made in the trunk, not in the branches.

The rubber trees can only be worked during six months in the year, that is, during the summer season, because during the rainy season the river rises to such a height that most of these trees go partially under the water as though taking a rest for the next six months of hard work. The work of gathering the sap usually commences at day-break and continues up to 11 o'clock, when the tapper stops for breakfast.

As the incisions are made the gatherer places a tin cup under each one, fastened by a kind of plastic clay.

After breakfast, about 1 P. M., or earlier if it is threatening rain, he starts to collect the sap in the cups, which he deposits in a 5 gallon tin can and return to his hut to smoke it.

Without delay, in order to avoid natural con-



gealment, the gatherer commences the smoking operations, which consist in exposing the sap to a very thick smoke produced by burning the "Urucury" nut (*attalea excelsa*) or the "Yua-uassu" (*manicaria saxifera*) which are very rich in oily substance. With a kind of paddle the gatherer dips into the sap or milk and holds it over the smoke, by which means the liquid it may contain is evaporated.

This process he continues, forming layer upon layer on the paddle, until all the sap is used up, giving him a ball weighing from 10 to 100 lbs.

This ball is then taken off the paddle in the sun. When the smoking is well done the sap or rubber is found in compact layers and free from any foreign matter. This is considered the best quality and is called *borracha fina* or fine rubber and, of course, brings the best price, that is, about \$1.10 or \$1.25 per kilogramme in Manaos. If, however, there has been any carelessness during the gathering or the smoking by allowing water or any other foreign substances to become mixed in the sap, the ball of rubber will be found full of lumps, air holes and curdy layers of rubber, which makes it less elastic than the unadulterated. This grade brings from \$.75 to \$.85 per kilogramme.

There are two or three other grades of rubber of less value, such as drippings, scraps and the caucho scrap. The first consists of drippings which adhere to the tree after the tin can, which is held to the tree by means of clay, is removed. The second is obtained from scraps which fall from the paddle while undergoing the process of smoking, and the third is obtained from the "Heavea Guyanensis" and is worth about \$.65 per kilogramme. The above method, just described is one used in the rubber region of the Amazon Valley.

In Peru, Colombia and many other South American countries it is customary to cut down

the trees and split them open in order to allow the sap to run out and coagulate. This rubber does not bring a very high price, due to the impurities, such as sand, pebbles, leaves, etc., etc., which it contains. The demand for rubber is growing greater and greater every year and some countries are beginning to cultivate it.

In Mexico some companies have been organized to enter the rubber market but there they have to plant the trees and will have to wait from 4 to 6 years before the trees can be operated, whereas in the Amazon Valley we find millions of the real rubber trees waiting for the tapper.

Of late years foreign companies have applied to the State government for some land and their applications have been granted, provided they conform themselves with laws of the State.

About 10 years ago there was not much money in rubber for the producer, because he was subject to two and sometimes three middlemen, but ever since the trans-atlantic company extended their telegraph cable 1000 miles up the Amazon river, in order to reach Manaos, the capital of Amazon State, the producer can, from Manaos, sell his products in New York, London, Paris, Hamburg or any other market and receive the latest quotations.

The uses of rubber are almost innumerable, as we can see for ourselves.

In the manufacture of electrical apparatus, the use of it is a necessity, in the medical profession, it is of extensive use for operating gloves, water bottles and many other goods of every day use.

With the increasing usefulness of the automobile a set of good, reliable tires comes next to a good engine, therefore if we wish a good set of tires it must contain, at least, 30% of pure rubber; even in our reliable old ice wagon, which we ride to and from school every day, we are sure to get in trouble every other day if we use a pair of cheap tires.



**SYMPHONY CLUB CONCERT.**

The Rose Symphony Club, on March 9, gave a very successful concert for the benefit of the Athletic Association. The audience, while not as large as might have been hoped for, was appreciative, and called for repeated encores from the three clubs.

The Orchestra opened the program with a selection from "The Country Girl." This selection contains some extremely good music, as well as some light, catchy airs, and the rendition of this furnished a pleasant surprise.

The singing of the Glee Club met with the usual cordial reception. Solos were sung by Lewis and Blanchard, and were very much enjoyed. The Mandolin Club, in all of its numbers, played well, with precision and shading which speak well for its leader.

Harry Shickel played, as a trombone solo, Wagne's "Song to the Evening Star," accompanied by the orchestra. This number was rendered in a way that speaks well for Shickel's ability as a trombone player, and was well received.

The program is given below :

**PART I.**

Orchestra—a. Selection, "The Country Girl."  
b. "In a Lotus Field."

Glee Club—a. "A Song for R. P. I."  
b. "Last Night."

Solo by F. B. Lewis, '05.

Mandolin Club—a. True Blue March.  
b. Heidelberg Stein Song.  
c. "Flirty Little Gertie."

**PART II.**

Orchestra—"Thoughts of Love." (Waltzes.)

Trombone Solo—Song to the Evening Star.

Harry Shickel, '07, and Orchestra.

Glee Club—a. "Elixir Juventatis."  
b. "Mighty Lak a Rose."

Solo by R. C. Blanchard, '05.

Mandolin Club—a. Northern Lights Overture.  
b. Cavaliera Rusticana.  
c. The a la Mode Girl.

Glee Club—"The Sword of Uncle Sam."

**THE GLEE CLUB AT PARIS.**

The Paris trip of the Glee Club on Thursday, March 30th, will be remembered by the members of that organization as the most enjoyable event

of its kind that has taken place for a long time. Exalted Ruler E. L. Weider and his brother Elks amply maintained the reputation for hospitality and good-fellowship which their lodge enjoys, and their efforts were fully appreciated by those that went, who were all glad to arrive and sorry to come away.

The following is the comment of the leading Paris paper :

One hundred and fifty people were in attendance at the concert given Thursday evening at the Elks' Hall, on East Wood street, by the Rose Polytechnic Glee Club, of Terre Haute. Those present were delightfully entertained, as the singing of the college boys was indeed a rare treat. The evening's entertainment was under the direction of Mrs. Allyn G. Adams, leader of the Glee Club, and it is apparent that the success of the organization is largely due to her superb training ability. There are some soloists with very fine voices among the sixteen members.

The program was carried out as follows :

We Meet Again Tonight, . . . . . Club  
Ching-a-Ling, . . . . . Solo by Blanchard, '05  
Jay Bird, . . . . . Club  
Massa's in de Cold, Cold Ground, . . . Solo by Post, '03  
Elixir Juventatis, . . . . . Club  
Last Night, . . . . . Solo by Lewis, '05

For Old Rose, . . . . . Solo by Fischer, '08  
Belinda, . . . . . Solo by Shickle, '07  
Spare the Old Homestead, . . . Solo by Blanchard, '05  
The Sunday School Scholar, . . . Solo by Kahlert, '06  
Dat Watermillion, . . . . . Solo by Shryer, '05  
The Sword of Uncle Sam, . . . . . Club

The audience was an appreciative one, and the singers were forced to respond with an encore for each number.

**GLEE CLUB.**

On March 26, the Glee Club, assisted by Mrs. Adams, gave a Service of Song at the First Congregational Church. Solos were sung by Post and Knopf. Prof. Frank C. Wagner occupied the pulpit.

**RESOLUTIONS ADOPTED BY THE STUDENT BODY.**

WHEREAS, We have been deprived by death of our fellow-student and friend, James Julian Taylor, of the Class of 1907,

*Resolved*, That we, the Student Body of the



Rose Polytechnic Institute, express our sorrow and sympathy to the bereaved family ; and,

*Resolved*, That these resolutions be spread upon the records of the Council, and that copies be sent to the family and to the ROSE TECHNIC for publication.

STRECKER, Sec'y.

#### RESOLUTIONS OF THE SOPHOMORE CLASS.

WHEREAS, We have been deprived by death of our friend and class-mate, James Julian Taylor, be it

*Resolved*, That we, the Class of Nineteen Hundred Seven, do take this means of expressing our feelings and of extending our heartfelt sympathy to the bereaved family ; be it further

*Resolved*, That a copy of these resolutions be forwarded to the family of our deceased friend and class-mate, and also a copy given to the Rose TECHNIC for publication.

W. W. KELLY,  
M. GOODMAN,  
H. L. DAVIES,  
Committee.

Again has the hand of death fallen in our midst. James Julian Taylor, a member of the Sophomore class, after a comparatively short sickness, died of typhoid fever at his home in this city.

He was born in Newport, Ky., in the year 1886. Later the family moved to Louisville, where he received most of his earlier education, and afterwards made Georgetown their home. Upon graduating from high school with honors, he attended Kentucky State College at Lexington until entering Rose last fall. Because of his cheerful disposition, he soon made many friends, not only in his class, but in the student body. A mother and sister survive him, his father having died when he was but a few years old.

His death occurred about 4 o'clock Wednesday afternoon. Beautiful floral tributes were sent by the students and by his class. On the following morning the class, as a whole, accompanied the body from the house to the station. He was laid to rest in the cemetery at Newport, by the side of his father.

S. A. G.







### INTER-CLASS MEET.

1907-30, 1906-24, 1908-0.

TO say that the inter-class meet was a surprise would be, to put it mildly,—the result itself being the only thing expected that happened. The team had been in training only a month, and no especially good records were looked for.

But when both heats and the final of the 20 yard dash were run in  $2\frac{1}{5}$ "', equalling world's record time, it was easily seen that the unexpected was going to happen. The high jump was second, Turk and Wischmeyer both clearing 5' 6", while Turk finally cleared 5' 7".

The next event, the shot put, went to Turk at 37' 8", with Peck second at 31' 9". Turk also won the hop, hop and jump, clearing 30' 4".

Another surprise came when McCormick, who before this year, had never done higher than 8' 6" in the pole vault, won the event at 9' 8", with Lee second at 9' 4".

The half mile run was won by Lee in  $2:19\frac{1}{5}$ , being any man's race up to the very finish. Several men, who failed to get places in this, made excellent runs. E. P. Lee came within a second of third man, and would probably have beaten him had he run closer to the pole. Eastwood would have done much better had he "hit 'em up" more from the start, being apparently as fresh at the finish as at the beginning.

#### SUMMARY.

20 yard dash—1st heat, 1, Lee; 2, Willien. Time,  $2\frac{1}{5}$ "'.

Second Heat—1, Turk; 2, Modesitt. Time,  $2\frac{1}{5}$ "'.

Finals—1, Turk, '07; 2, Lee, '06, 3, Modesitt, '06. Time,  $2\frac{1}{5}$ "'.

Running High Jump—1, Turk, '07; 2, Wischmeyer, '06; 3, tie between McCormick, '07, and Eastwood, '06. Height, 5' 7".

Hop, hop and jump—1, Turk, '07; 2, Modesitt, '06; 3, McCormick, '07. Distance, 30' 4".

Shot Put—1, Turk, '07; 2, Peck, '06; 3, Modesitt, '06. Distance, 37' 8".

Pole Vault—1 McCormick, '07; 2, Lee, '06; 3, Willien, '06. Height, 9' 8".

Half Mile—1, Lee, '06; 2, Turk, '07; 3, Johnson, '06. Time,  $2' 19\frac{1}{5}$ "'.

### BASKET BALL TEAM'S RECORD.

The All-Indiana basket-ball team for 1905, according to Coach Connors, of Indiana University, and several other prominent coaches of the State, is as follows:

Forwards—Bohnstadt, of Butler; Hirsch, of Purdue.

Center—Spro, of Wabash.

Guards—Wicks, of Wabash; Johnson, of Rose.

However, we think there are several men who could compete successfully against either Bohnstadt or Hirsch. Among these are our own forwards, Daily and Thurman, besides Lehmann and Walters, of Wabash, and Carr, of Indiana University.

Below is given an outline of individual points scored by the team during the last season, which

s, in a way, self-explanatory, though not entirely fair.

Trueblood's record shows more goals to his opponent's credit than to his own, while, if Trueblood had not paid his entire attention to teamwork, and not individual play, our team would not have been the fast, smoothly playing one it was. It was as it should be, a plain case of the captain belonging to the team, and not to the grand stand.

Johnson's record, too, apparently does not come up to Lindeman's, but it was Johnson's guarding and floor playing that allowed Lindeman these chances at goal.

The summary is as follows:

	Goals Thrown	Goal thrown by opponents	Fouls	Foul Goals
Daily, F . . . . .	38	7	22	0
Thurman, F . . . . .	34	8	18	72
Trueblood, C . . . . .	22	25	36	3
Lindeman, G . . . . .	30	20	35	1
Johnson, G . . . . .	5	17	37	0

#### BASE BALL.

The base ball team is showing up very strongly for so early in the season, though there will still have to be some changes in the line-up.

Of the old men, Reed at catch, Freudenreich at second, Stoddard at short, and McBride in right field, are all holding down their positions in good form, and are improving greatly in batting. In the pitcher's box, Daily is having a great deal of trouble with his shoulder, but he will be ably assisted by Douthett, who shows evidence of fine pitching ability, having speed, curves, and control, lacking only experience.

At first, Mooney shows up well, and after he has learned some of the fine points of the game, will probably be as valuable as any man on the team.

Third, at present, is presenting the greatest problem on the team. Moore, a Freshman, is a good hitter, and a born ball player, but will not pay attention to base running signals, or to the little points in infield work which are so important. Bland, who has been in left, will probably be given a trial at this bag, in hopes that he has the making of a third baseman in him. He has

been playing in left and is by far the cleanest fielder Rose has, though so far he has not shown up very well at the bat. If he should make third, Daily and Douthett will probably alternate between pitch and right.

Miner seems to be a fixture in center, made vacant by Bowsher's graduation. He is sure on flies, keeps his head well and knows the game, but is slow on the start, a fault which probably will be greatly remedied before the season is far advanced.

Of the other candidates, Greenleaf and Schmidt are showing up well, and will probably be the regular substitutes.

#### TRACK WORK.

If all the reports which come from Wabash were true, Rose would probably not stand a show at the State meet; but until they are proved true, we shall still continue, at least, to have some hopes of winning.

In the 100 and 220, Turk, Willien, and Lee will likely be the entries, but at present all seem slow on the start. In the 440 it looks as if Turk will have it all to himself, there being no other candidate at present. In the half and the mile it is guess work at present, Cannon, Kelly, Eastwood and E. P. Lee being the most promising candidates, while Trueblood will probably be out soon. In the high hurdles, Peddle will be in, and in his old form, should win them at the State meet; Ryan has improved in them wonderfully this year, and should be a comer.

In the 220 hurdles Modesitt, Lee, Ryan and Willien are at work, but as yet no one has been able to come up to Modesitt's form in running these.

In the shot-put the team is as much at a loss as in the distance runs. No upper-classman can put it, and the Freshmen won't, so it looks as if this duty also would fall to Turk.

The discus will be well cared for by Turk and Brannon, and though the latter is a little erratic, practice and form will soon overcome this.

In the hammer, Brannon holds the present State record, and unless some Freshman makes good,



will probably be our only competitor in this event.

Wischmeyer has the high jump record, but will probably be closely pushed by Trueblood and Eastwood. Kelsall is also improving steadily.

In the pole vault, the result is a toss-up. Larkins has the best record, and is doing the steadiest. Willien has improved greatly, and McCormick should be much better when he perfects his new form.

In the broad jump, no one is in it with Turk, who has gone two feet farther than the next man, Wischmeyer. Eastwood also promises to do something in this before the season is over.

Taking it in all, if we can secure a shot-putter and a distance runner, we will have a well balanced track team, but until then we have our work cut out for us.

#### NOTES.

If Turk keeps up his present work, some of the big State Records will be broken before the year is over. Already, in practice, he has broad jumped 22', and has thrown the discus 112'.

The inter-class meet was a farce, as far as "inter-class" was concerned, the Freshmen not winning a point, and the Seniors not having a single man competing.

Several practice games of base-ball have been played with the T. H. H. S., resulting in scores varying from 9-0 to 25-0 in favor of Poly. In a game with a team composed of scrubs and Terre Haute professionals, the Varsity was victorious 3-2.

Two new school records were made in the in-

door meet. The 20 yards in  $2\frac{1}{8}$ " by Turk and Lee, and 30' 4" in the hop, hop and jump, by Turk.

Quite recently cases have occurred where students have destroyed property of the Athletic Association, and in one case the base-ball diamond, which had just been cleaned, was littered with shingles.

Now, these things were probably done "in fun," without any destructive intent, but please remember that the Athletic Association gets the results of this fun without any of its benefits. Apparatus or materials that have been bought by it, should be considered its property, and it intends that it shall be considered so. All students will please remember this in the future.

John Cannon, '06, has been appointed captain of the second base-ball team.

Mr. F. N. Hatch, Manager of the 1905 Football Team, has been hard at work on his schedule, and as a result, the last contract has been signed.

There will certainly be some good hard games, and everybody will have to work to make a creditable showing against such teams:

The schedule is as follows:

Sept. 23—T. H. H. S., . . . . .	at Terre Haute
Sept. 30—Eastern Illinois, . . . . .	at Terre Haute
Oct. 7—Washington Univ., . . . . .	at St. Louis, Mo.
Oct. 14—Milliken, . . . . .	at Terre Haute
Oct. 21—Kentucky Univ., . . . . .	at Lexington, Ky.
Oct. 28—Shortridge H. S., . . . . .	at Terre Haute
Nov. 3—Hanover, . . . . .	at Terre Haute
Nov. 11—Culver M. A., . . . . .	at Culver
Nov. 18—Earlham, . . . . .	at Richmond
Nov. 25—Eastern Illinois, . . . . .	at Charleston
Nov. 30—Normal, . . . . .	at Terre Haute







Spring has come; and with it that delicious "tired feeling."

Said one Freshman to another: "This Spring weather makes me wish I were three blocks from home."

"Why three blocks from home?"

"Then I could walk home in a few minutes."

"Why don't you wish you were at home?"

"I don't want to be a hog about it; I am always reasonable in my wishes."

Jackson (in Machine Design)—"Have you worked the Army and Navy problem?"

Johnson—"Which problem do you call the 'Army and Navy' problem?"

Jackson—"The one about the 'arms and naves' of pulleys."

#### SOME FRENCH TRANSLATIONS.

"Between acts they went out into the lobby and took on refreshments."

*Allons par le bateau-omnibus*—"Let us go on the water-wagon."

*Au cocher*—"To the coacher."

*Quelle foule de monde*—"What fool people."

Dorn and Hill, '04, and Demmitt, formerly '06, spent two days in Terre, visiting their M. E. P. brothers. They were the guests of Ed Daily.

#### A SERIES OF GOOD RESOLUTIONS, OCCASIONED BY A CHANGE OF BEANERY.

Robbins, '08 swears off from constitutionals before breakfast.

Boase, '08, swears off from his slow alarm-clock. Corson, '08, and King, '08, swear off from looking at the Mansion House.

Dodge, '08, swears.

Knopf, '08, doesn't know how to swear.

Andrews, '08, swears off carrying trunks at night.

Garvin, '07, swears off from sandwich stories.

Nourse, '08, and Hull, '08, swear off from the barber's business.

Evans, '06, swears off from girls who claim to possess R's.

Wilkins, '06, swears off from mother-of-pearl midnight calls.

#### IRISH?

H. Schickel (rushing back to the Poly)—"I forgot something I didn't think of."

Professor Hathaway, in analytics—"Now, take a perfectly frictionless tube that has no friction in it."

Compare a taste with what makes it. Lick—Licker.—[*Ex.*]

Fischer, at the Inter-class meet—"Say, how many trials do they get in the half mile?"

(A moment later)—"Does that shot weigh fifty pounds?"

Professor Hathaway—"Boys, don't learn the formulæ by heart. Why, when I want to use one, I just write it down."

From one of Daddy Wires' lectures—"No, we

don't plant trees for our ancestors and forefathers, that is too far in the future."

Canfield—"I bet Dr. White gives us about four numerical problems on the exam."

Cannon—"And the answer to all of them will be zero—for most of us."

Kruger, '08, defines an ellipse as a squashed circle.

Bond, '07—"Professor, does the diameter of a sphere pass through its center?"

Freshman—"Say, Atherton, are you going to work for the Westinghouse at sixteen cents per hour?"

Atherton, '05—"Indeed not; I shall consider no position which pays less than a hundred dollars a month."

## EXCHANGES.

Norman Cole, '05, of Stanford University, has been notified that his pole vault of 12' 1.32", made last April, has been officially recognized as the world's record.

The Georgetown fencers won six of nine bouts from Princeton in Washington. Columbia fencers defeated those of the University of Pennsylvania seven to two.

Cornell is to send her Varsity crew to race with Harvard on May 27 in the Charles River Basin. Harvard has a good chance of winning this year, as she has six of last year's Varsity men back, while Cornell has but two.

Pennsylvania is to adopt a new foot-ball coaching system this fall. It will consist of an advisory board of five, and a board of coaches consisting of a field coach, an assistant field coach, and six individual coaches.—[*Tech.*]

William Jennings Bryan will deliver the commencement oration at the University of Nebraska.

Chess is one of the many forms of college activities. The University of Cambridge has ac-

cepted a challenge for an international tournament from Harvard, Yale, Columbia and Princeton, to be held April 15th.—[*Wesleyan Argus.*]

One hundred and thirty men, reported as candidates for batting practice on the base ball squad at Yale.

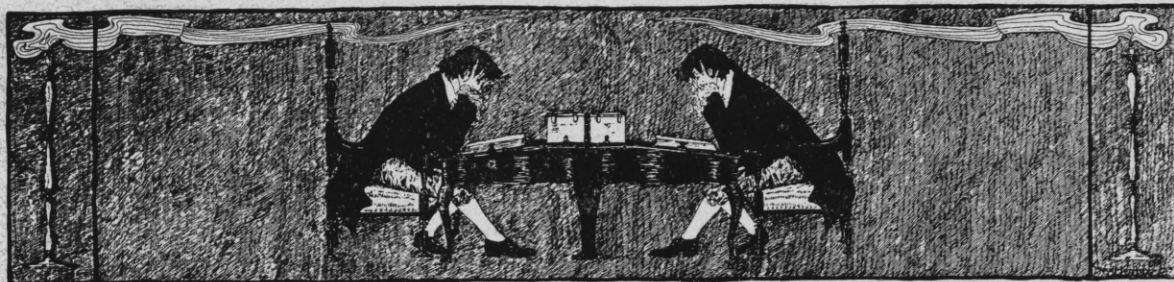
Andrew Carnegie has offered the University of Virginia \$500,000 on condition that the University raises an equal amount.—[*Case Tech.*]

Yale's glee club took a 4,000 mile trip this year. The farthest west concert was given at Colorado Springs.

Case is to have two new buildings in the near future, a Mining Laboratory and a Physics Laboratory, both of which are to be built by John D. Rockefeller. The buildings are both to be built of brown-tinted brick, trimmed with white stone and have red tile roofs. The decorations are to be of the period of Italian Renaissance. The Physics Lab. is to be two stories high and 132 ft. by 75 feet, while the Mining Lab. is a two-story structure and has a floor space of about 14,000 sq. feet.—[*The Case Tech.*]







## REVIEWS

THE Proceedings of the American Institute of Electrical Engineers for March contains two papers devoted to the subject Line, Construction for High Pressure Alternating-Current Railways, also a paper on Track Bonding. These papers were presented before recent meetings of the Institute.

SAMPLE copies of Marine Engineering and The Boiler Maker have been received from the Marine Engineering Publishing Co.; also a copy of the Street Railway Journal from the McGraw Publishing Co. These will be cheerfully submitted to any one who may desire to see them.

THE C. W. Hunt Company, of New York, sends a pamphlet which is devoted to the noiseless conveyor, which that company has developed for the handling of coal and ashes in power stations. The booklet is profusely illustrated with photographs which show the construction of the conveyor and some of the more important installations where this apparatus is used.

THE American Society of Civil Engineers has issued a circular, stating that the publications of the International Engineering Congress, 1904, are now in press and will soon be ready for distribution. The publications of the Congress will consist of six volumes, covering more than 3,000 pages with 600 illustrations. There are 97 papers prepared by special invitation, and the resulting discussions on the 37 subjects selected for presentation.

The subjects discussed were:

Harbors, Natural Waterways, Artificial Waterways, Dredges, Wharves and Piers, Purification of Water for Domestic Use, Sewage Disposal, Disposal of Municipal Refuse, Railroad Terminals, Underground Railways, Live Loads for Railroad Bridges, Ventilation of Tunnels, Manufacture of Steel, Manufacture of Cement, Concrete and Concrete-Steel, Tests of Materials of Construction, Purification of Water for the Production of Steam, Turbines and Water Wheels, Locomotives and other Rolling Stock, Passenger Elevators, Pumping Machinery, Steam Turbines, The Substitution of Electricity for Steam as a Motive Power, Electrical Power-Generating Stations and Transmission, Ordnance, Fortifications, Naval Architecture, Marine Engineering, Light-Houses and other Aids to Navigation, Dry Docks, Irrigation, Highway Construction, Deep Foundations, Mining Engineering, Engineering Education, and Surveying.

The price has been fixed at \$5 per volume (in paper covers), but it is probable that a discount of 25% can be obtained through the agency of the TECHNIC.

THE Bullock Electric Manufacturing Company has recently furnished the Slawinigan Water and Power Company with an immense frequency charger which consists of an 8000-h. p. synchronous motor, a 5,750 K. W. alternating-current generator and a direct-connected induction motor for starting purposes, all mounted on the same base. This is said to be the largest frequency charger ever built, being composed of the largest alternating current generator in operation at the



present time and the largest electric motor ever built. The total weight of the set is almost 500,000 pounds.

OWING to the exhaustion of many of the former sources of supply of timber for cross-ties, the Pennsylvania Railroad has been experimenting with the planting of trees on property belonging to the company, in order to determine the feasibility of thus supplying its need of timber. The number of cross-ties used annually by this company in its repairs and extensions is estimated at 3,500,000, and while it is not expected that the company will ever attempt to plant sufficient trees to supply its entire need, the experiment has been undertaken in the hope that it will encourage the cultivation of timber land for such purposes by others. About 280,000 trees have been planted so far, and it is stated that within the next year it is proposed to set out 800,000 additional trees. The yellow locust has been selected for this purpose, as it is claimed there is no other timber which combines so well qualities of durability and hardness.

#### Manganese Steel Rails.

THE Boston Elevated Railroad has experienced considerable trouble, due to the rapid wearing away of steel rails on some of the sharper curves on its line. At some of the sharp curves the commercial Bessemer steel rail, low in carbon or other hardening ingredients, has been known to completely wear out in from 40 to 50 days. A number of rails were rolled which were high in carbon and these were laid in the track with good results, lasting about three times as long as the ordinary commercial rails and costing but little

more. Some nickel steel rails were also tried, and while they were an improvement over the commercial soft rails, they did not prove in the end to have as long a life as the hard carbon steel. Rails made of manganese steel have recently been experimented with and it was found that they gave much better service. The following article on this new type of rail is taken from the *Railroad Gazette*.

"Manganese steel is cast into the required shapes, as it cannot be rolled or machined. It is a metal exceedingly difficult to handle in the foundry, as it must be poured at a very high heat and its shrinkage is enormous, compared with ordinary cast steel. It is almost impossible to make intricate casting, on this account, and the metal is so tough and hard that it cannot be machined. All finishing must be done with grinding machines. The rails furnished to the Boston Elevated were cast in 20-ft. lengths with the bolt holes for the joints cored in the web. A drill which will drill a hole in a Bessemer rail  $\frac{3}{8}$  inch deep in one minute makes no impression on a manganese rail. The rails are very ductile, however, as is shown by the following test of one of the 20-ft. lengths. It was first bent cold to a 20-ft. radius; half of the length was then straightened and bent to the reverse curve of 20-ft. radius. The other end was then bent to a 10-ft. radius and no signs of fracture were observed at any point. In the matter of cost the manganese rail is very expensive, as compared to commercial Bessemer rail, but its long life makes it economical to use in such places as the elevated curves, where rail renewals are expensive to make. The Manganese rail costs about \$5 per foot, as against 38 cents for Bessemer rail."

