

### THE AUTOMATIC TELEPHONE EXCHANGES.

#### The Stronger Automatic.

During the past few months the department of electrical engineering has received some valuable additions in the way of telephone apparatus. In addition to several manual boards of different types we now have in operation two automatic exchanges, one being a system installed for

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Headquarters for  
Window Shades, Lace Curtains  
and Rugs

Post Cards—All Kinds  
MUNSON & CARLIN  
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## JOHN WITTMANN Tailor Shop

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Fit and Promptness.....

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## EXCHANGE SHAVING PARLOR

J. E. GRICE, Proprietor.

## HOT AND COLD BATHS

NEXT DOOR TO EXCHANGE HOTEL  
BRYAN, TEXAS.

## Dr. W. H. Lawrence DENTIST.

OVER HASWELL'S BOOK STORE

## Engraved Visiting Cards

## Embossed Stationery

## The Cargill Company

FINE ART STATIONERS

HOUSTON, TEXAS

## BRYAN ROLLER RINK

THREE SESSIONS DAILY

9:30 a. m. to 12:00; 2:30 p. m. to 5:00 p. m.  
7:30 p. m. to 10:00 p. m.

SOMETHING DOING ALL THE TIME

MUSIC BY THE BAND EVERY WEDNESDAY & FRIDAY NIGHTS

the College Telephone Company, the American Automatic Telephone Company of Rochester, New York. The other a small system presented to the Texas A. and M. College by the Automatic Electric Company of Chicago. We now have some of the finest apparatus made and those students desiring to specialize in telephone engineering will find here an equipment such as can be found in no other school of the South, and in the North only those schools having a regular telephone course can boast of equipment to compare with what we now have.

Automatic exchanges mark a new departure in telephoning, and that they have come to stay is assured, though as yet such systems are still in their infancy and same not yet out of the experiment stage.

The systems we have here while having certain similar fundamental principals mark a widely different plant each having some advantages over the other. Some points in favor of the American system are simplicity of calling, mechanism which in addition can be used on any common battery telephone, removing any one switch does not interfere with the operation of any phone as another switch will automatically take up and do the work of the disconnected switch, and last but not least it does not require a ground connection. The Strowger system has the advantage of finer mechanical adjustment many of the defects having been eliminated, by fifteen years' experimenting. Their impulse wheel which has not one-fifth the number of teeth used on the American calling device gives a longer interval of contact, thus giving the switch more time to operate.

The first patents for the system as manufactured by the Automatic Electric Company of Chicago were taken out by Alman B. Strowger early in the '90's, and on Nov. 3, 1892, the first exchange was opened. This was a crude affair having fine wires leading to the subscriber's phone. The system was replaced several times, each one being an improvement on the preceding one, and in '97 a switch was brought out resembling in all vital points the switch of today. The system presented to the College is composed of parts of sections taken from a one thousand line switch board. The phones are very similar to the common local battery telephones but in addition have a calling device, or sub-station selector, which operates the switches in the exchange by grounding the one or the other side of the line a number of times corresponding to the numbers you select on the dial of the subscribers calling device. This dial has ten holes in it, each being numbered, the numbers beginning with 1 and ending with 0. In making a call, first remove the receiver from the hook then if you wish to call, say 112, put your finger in the hole marked 1 and pull the dial to the left until the finger strikes the stop, then let the dial rotate back to its original position, repeat the operation for each of the other numbers. Having finished this operation you have your connection and you are ready to ring the party, which is done by pressing a button on the front of the phone. In case the number called is being used you will hear a sound in your receiver notifying you to that effect.

The advantages of the Strowger Automatic System over the ordinary exchange board are practically the same as those described below in connection with the American Automatic System.

### THE AMERICAN AUTOMATIC.

The American Automatic Telephone System, which has been recently installed, is quite an interesting and novel departure in automatic telephony. This system was invented and put upon a commercial basis by Mr. Chas. Lane Goodrum. Mr. Goodrum is a graduate in the C. E. Department of the University of Georgia. He was formerly connected with the Bell Telephone Company, and also with the Chicago Electric, in the capacity of chief engineer, and in the present company, The American Automatic Telephone Co. of Rochester, N. Y., he holds the same position.

Although this system is a very recent invention the company have several exchanges in operation at various points, which are giving entire satisfaction. The exchange situated here is one section of a twenty-five hundred line board, and is itself wired for two hundred and fifty phones, though only one hundred are available with the apparatus on hand. It is the purpose of the directors here to have some seventy-five or eighty phones connected at once, but no doubt the entire one hundred will be in service before the exchange is very much older. There are now about sixty phones in good working order upon the campus, and are giving very satisfactory service.

Like all great inventions this system is simplicity itself, though a casual glance at the switchboard and apparatus, might mislead one into thinking it a very complicated affair. It is primarily a two wire system, making no use of the third, or ground wire, whatever, which heretofore was considered an impossibility, and in this respect it differs altogether from any other system in operation.

Of course, everyone understands what is meant by automatic. Namely, that an automatic telephone switchboard is one that gives the desired connections automatically. That is, no operators, or "Hello" girls, are necessary for a subscriber to secure any number he wishes. Because this connecting is done by means of mechanical, and electrical combined, devices called switches, and not by plugs and the like. Thereby dispensing with Central operators entirely, a single "wire chief" being able to look out and care for almost any sized exchange.

In most automatic systems each subscriber has an individual switch for his particular instrument, but it is not the case in this system. Each fifty phones are so arranged as to be handled by a group of twelve switches, from which group the subscriber can, at will, secure connections with any other desired party. This is quite an advantage, as it is economical in space as well as in manufacturing the apparatus. A switchboard of this system occupies less floor space than one of any other system, and a twenty-five hundred line board will occupy practically no more floor space than a one hundred board will, on account of the sections being placed one above the other. Each telephone is provided with a sub-station selector or calling device, with numbers in rotation from one to fifty. This selector is circular in form, and the calls are made by placing a plug in the holes corresponding to the numbers and pulling the dial to the left until the stop is reached. Then remove the plug and the dial returns to its former position, giving enough impulses through an electrical contact to connect the party calling to the one called. These selectors are very simple, consisting of a single electrical contact which by making and breaking the circuit, due to impulse wheel, operates the various switches situated in central office.

When a person desires to make a call, he first removes the receiver from the hook, by so doing he closes the circuit, thereby causing what is known as a distributing switch to operate in central office. This switch supplies current to the first group of finding switches, and is so arranged as to do so successively. In other words it supplies the first switch at the first movement, the second upon the next, and so on. As soon as one of these switches has advanced its arms far enough

around to come in contact with the wires leading from the party's phone the distributor stops, and the other switches started by it fall back to their normal position, with the exception of the switch which has found the line. This all takes place almost instantaneously and unknown to the party calling. Now everything is in readiness for the party to call the desired number. But before we go any further, a little explanation is necessary, the numbers are arranged upon a hyphenated system, meaning that two movements of the dial are necessary to get the required line. The first call throws one into a group, while the second call operates one of the switches in the group called which gives the connection. In the present instance there are only two groups, so the first number called will always be either a one or a two. The numbers run from 1-1, 1-2, 1-3—to 1-50; 2-1, 2-2, 2-3, 2-4,—to 2-50.

Now, after removing the receiver, the party places the plug in the hole corresponding to the first or second position, as the case may be, pulls the dial around to the stop, removes the plug, allowing the dial to return to its former position, and then in the same manner proceeds to call the last number. When the one or two is called, the switch which has found his line in the central office, moves up to the first or second contact and transfers the current into the first or second groups. When the party calls the last number, the switch in the group called swings around to the contact indicated by the number of impulses received from the selector, throws the current out on this line and rings the called party's bell. This bell continues to ring intermittently until he answers, or until the party calling hangs up his receiver, which immediately releases all switches employed by him. As soon as No. 2 answers the ringing current is cut off, and everything is ready for the conversation. The switches are so arranged as to give a "busy" signal to the party calling, should the other person be using his phone at that instant. Also, should the party called hang up his receiver before the one calling, the party calling would receive a "busy" back through his receiver, denoting that he is disconnected from the second party. Upon hanging up their receivers they are at once released from all switches, and may proceed to call any other number. In the large exchanges there is a phonograph using a golden record, which revolves constantly, and when a person calls a line that is busy, the phonograph is automatically connected to the line and tells the one calling "This line is busy." This is only practical in large exchanges.

Of course, as there are no operators in the office and as everything is accomplished by mechanical and electrical means great privacy of conversation is assured. It being impossible for any one to get in and hear what is going on.

The switches used in operating the calls are interchangeable in their certain positions. And any one or more of them can be removed without interfering with the proper operation of the board. They are replaced by merely slipping them into their proper position, where they make sliding contacts with the outside wiring and are held in position by small clamps. It is a great advantage to be able to remove the switches so easily, as one can take any switch out and replace it with another in a few seconds, thereby insuring against tie ups due to a switch getting out of order. There are four different kinds of switches used in securing every connection, and all of these can be interchanged with any other of its particular type.

On the telephones themselves, there are no dry batteries used, all necessary current being supplied direct from the central office, thereby doing away with the annoyances caused by the giving out of the dry batteries. Each phone is provided with a small electric light placed directly under the transmitter, which serves in finding the numbers at night. This exchange at College Station is connected to the central energy exchange of Bryan, Texas, and enables any one to call any number in Bryan, or any long distance point desired.

It was not our purpose to give a concise description of the system in this article, but merely to give a general idea of its operation and a few facts in regard to it. It would be impossible in so short an article to describe its many advantages. Only by practical usage can its usefulness, convenience and superiority over other systems be manifested.

### JUNIOR TEXTILE PRACTICE.

The Junior Textile Engineers have two distinct branches of practice: Yarn Manufacture and Weaving. Both of these do not come in one afternoon's practice but to get an idea of what the Junior T. E.'s do both must be taken into consideration.

Practice in Yarn Manufacture consists of taking the raw cotton from the bale and working it into finished yarn or thread ready for the weave room. The bale is first opened and thoroughly mixed, then passes through a series of machines called lappers which partially clean the cotton and form it into a roll or what is known as a lap. It is now ready for the carding machine, where it undergoes essentially the same process that our grandmothers' once used and here takes on its first semblance of yarn as sliver. The processes that this stock goes through until it becomes thread or yarn consist, first, of parallelizing the fibers; second, drawing it out and twisting it into a continuous thread which is wound on a bobbin at the spinning frame.

This yarn reaches the weave room in two forms; one as it left the spinning frame to be used in the shuttle on the loom the other, as what is known as warp. The warp is formed by the yarn having been put into such a shape that it forms a solid sheet of threads running lengthwise the cloth when it is woven. Practice in weaving begins here with putting the yarn on the loom and setting the parts of the loom and gearing it up so that it will produce the desired cloth with its proper design and width.

#### With the Plant Husbandry Juniors.

At Plant Husbandry practice the sophomores, juniors and seniors are in one class. The work for an evening is at present pruning peach trees. The sophomores were divided into sections, one section to a row of trees. The seniors were placed over the sections as directors. The juniors were given the instruments for special work, such as saws, topping shears, and heavy pruning shears.

The seniors did the most important pruning themselves, directing the sophomores at the same time. The juniors were called from one tree to another, cutting the larger limbs and pruning the tops of the trees which had been otherwise finished. Prof. Kyle supervised the work and was the authority on the questions of pruning that arose.

Other practice of the juniors is grape pruning and stock cutting. Grafting will be done later in the term.

#### TRACK TEAM.

Mr. Spivey has been put in charge of the track team. He has sixteen men out trying for the different events. Just think about sixteen men on the track team and of this number twelve are "fish." Are we going to let the Freshman class carry away the honors on field day, April 21, 1907? I say no, so come out and let's do something. Four of these men are juniors, one of the "fish" is a Sophomore, but not a Senior has shown up yet. There are several good men in the Sophomore class, why not come out and show these "fish" what you are made of. The Juniors are not all dead, but some have been sick since the banquet. Go down and get "Doc" to fix you up, and come out and do something for A. and M. Now what is the matter with Seniors? Are you going to let the underclassmen lead you on the athletic field.

Now, fellows, those big cakes that are going to be won the twenty-first of April will be mighty good. You might win a suit of clothes, a hat, a pair of shoes, or a dozen pair of socks. Yes, and remember the T. W. C. girls will be out to watch you, and maybe you can win one of them, not at the instant, but later on.

Don't forget that the track team will be in the Track Meet, at Waco, which will be held in May. The men who show up best on the twenty-first of April, will be the ones to represent A. and M. at Waco.

Now, wake your fellow classmate up to the fact that he is not doing either himself or the track team justice by remaining dormant.