



## LOS ANGELES CALL INDICATOR CONVERSION

IT IS GENERALLY conceded that the Los Angeles call indicator conversion, completed on the night of March 29, was the largest job of the kind ever accomplished.

Nearly half the 230,000 telephones in Los Angeles being machine switching, that number was directly affected in the improvement.

In August, 1921, the engineering was started and plans were put under way to devise the best means of completing the complicated task.

Installation of equipment and outside plant rearrangements were started more than a year ago, and much of the work was kept going twenty-four hours of the day and seven days a week for a good many months in order to meet the scheduled date in March. For the last six months of the installation period, there was no let-up in the work on call indicator and associated equipment; the installation crews worked during the day-

light hours and testing was carried on throughout the night.

So when the word went through the organization several weeks before the appointed date that things were practically in readiness and that the actual work had been accomplished by a safe margin ahead of March 29, which date had seemed all too close several months before, many a Los Angeles telephone man swelled out his chest with a feeling of genuine pride of accomplishment.

There were no "loose ends" when the all-important day arrived. There was very little anxiety. The final step of cutting the new equipment and new trunks into service held about the same small amount of worry for Los Angeles telephone people as the launching of a ship holds for the shipbuilder. Everyone was, of course, anxious to see whether the new system would ride serenely through the expected heavy waves of traffic



The Los Angeles call indicator training organization consisted of forty-six instructors. The training of a call indicator operating and supervisory force of 646 employees was accomplished in thirty days. The training was conducted at thirteen training centers. Twenty-two training positions were used in training the force required to operate the 129 call indicator positions cut into service at midnight, March 29, 1924. Much credit is due the instructors for the enthusiasm and energy which they put into the work. The interest taken by the operators and supervisors who received the training contributed greatly to the success of the training program. The training organization sponsored a dance which signalized the conclusion of the call indicator training program. This affair was attended by over one thousand traffic department employees and their friends. Left to right, front row—R. Wilkerson, D. Hussir, R. Allen, L. Anderson, K. Carpenter, L. Neeper, A. Young, G. Habich, M. Penrose. Second row—T. Sullivan, E. Bauer, A. Myers, A. Eiselt, V. Smith, C. Collins, M. Rumpf, M. Tyler, L. Roberts, F. Warner, A. House, G. Bantow. Third row—A. Bryant, M. Rant, G. Brenton, H. Schwarke, W. Dempsey, M. Bailey, M. Kilroy, C. Blais, E. Lake, F. Sweeney, R. Schmidt, C. Dormann. Fourth row—F. Starkenberg, M. MacDonald, F. Smith, E. Brown, M. Breitenbach, C. Reeb, C. Reiner, J. Furrer, E. Oyen, C. Gay, K. Carter, E. Leinweber, L. Moore.



*This shows a portion of the typical relay equipment associated with the call indicator method of operation. The apparatus is being routined to make certain it is in proper condition.*

while a city of a million people was getting used to a new method of telephoning, but no one could see how anything could go wrong. Just as the shipbuilder knows his ship is in readiness long before it leaves the ways, so did Los Angeles telephone people feel confident that the job would prove a 100 per cent perfect affair.

And so it proved to be.

The conversion was completed by the cutting in of 130 call indicator positions, 5000 new trunks, and the disconnection of 4000 call circuit transfer board trunks.

Sunday, March 30, gave a big city telephone system to Los Angeles. Los Angeles opened its new red-covered telephone directory, looked up the new number, and started dialing the new way "slowly but surely."

The educational program had been so suc-

cessful that calls to the "9" operator, which was the old method of obtaining connection from a machine switching to a manual telephone, dropped to within 9 per cent of normal on Monday, March 31, the first big telephone day. Preparations had been made to take care of 30 per cent of normal.

News stories appeared in every Los Angeles paper commending the telephone company for the success of the change. The reception by telephone users of the new method of operation was little short of wonderful and far surpassed the most optimistic expectations. The public recognized the improvement and was whole-hearted in its indorsement of it.

It is not possible to "cover" adequately an electrical engineering task of this kind with its many technical angles and ramifications.



touching on public relations in a single story of limited length. Only a few of the high lights can be given, and nothing more will be found in this article. There is even a very great possibility that many of the high lights will be left out or given but little emphasis, so let it be said here that such elisions are the result only of the dictates of space.

In August, 1921, the conference was held in which plans were formulated for replacing the Los Angeles transfer boards with call indicator equipment, and of introducing a metropolitan numbering plan.

Soon after, engineers started working out the fundamental plan for the entire company to follow which would result in the conversion to the new operating methods.

Just as in all great plans, there were a thousand difficulties to overcome and a thousand objections to meet and answer. It speaks well for the engineers who worked out the original methods and aimed the efforts of the entire organization at one definite objective that never was there a time during the years of work when any department found it necessary to deviate far from the preconceived line of action. And this, by the same token, speaks well for all departments of the company.

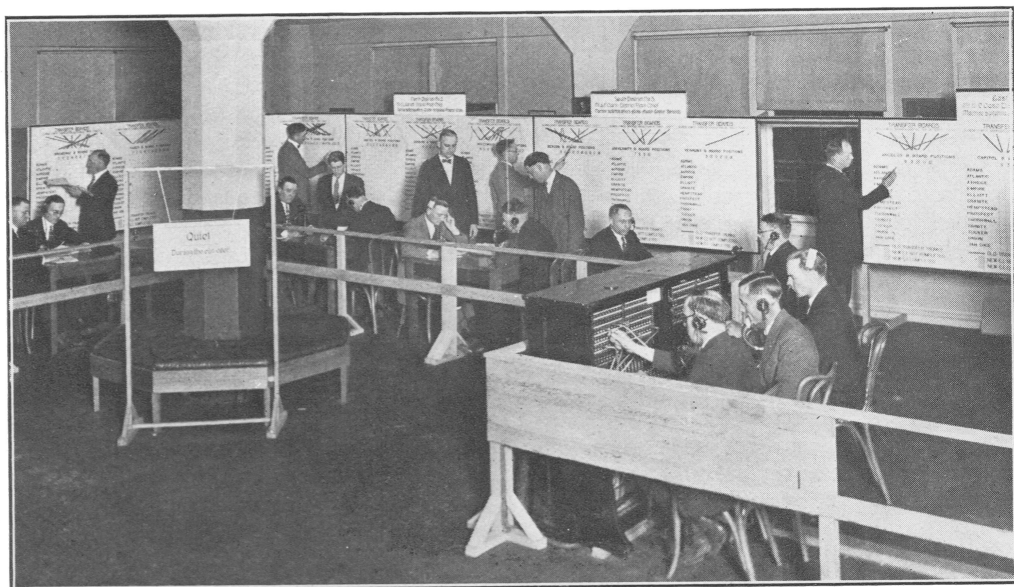
The first meeting of the coördination committee was held in February, 1923.

C. W. Burkett became chairman and C. C. Kastner was the first vice chairman. V. W.

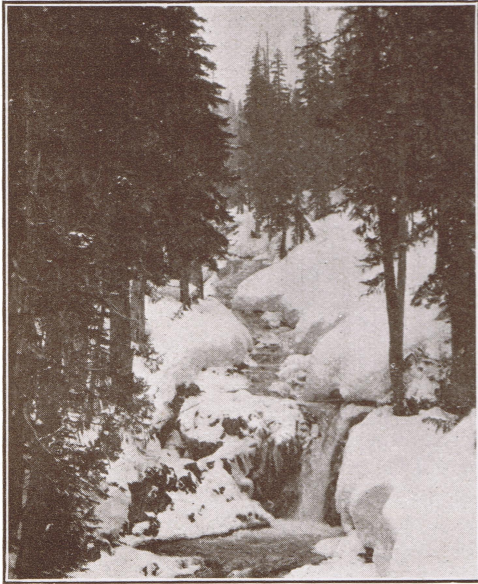
Russell replaced Mr. Kastner as vice chairman of the committee in June, 1923, and later R. J. Whittaker replaced Mr. Russell. Upon the arrival of R. A. Gantt as chief engineer of the Southern California Telephone Company, the chairmanship of the committee was assumed by him.

The other members of the committee were I. F. Dix, N. R. Powley, F. N. Rush, L. C. Miller, G. DeNevers, C. H. Weldon, J. P. MacNicholas, N. R. Roberts, and B. C. Groh. B. M. Moulder was appointed secretary.

The traffic department's work in connection with the change followed three lines of effort—the fundamental engineering work of determining the amount of equipment which would be required was one; just how many second selectors, how many call indicator positions, and how much of all the rest of the intricate apparatus would be needed on March 29 and later had to be estimated more than a year in advance. Just how much equipment each of the twenty-nine central offices of the system would need and how many trunks would be required to handle the traffic between offices had to be known before any actual installation work could be done. And once these estimates were completed, this problem was by no means solved. The added work was caused by the very rapid increase in telephone demands in Los Angeles. That there was absolutely no overloading of call indicator equipment or



*This is the nerve center taken during the critical period of the big cutover. All orders are being directed from this central point and a progressive record is being made as the various cutover steps are being executed.*



ON THE TRAIL TO PARADISE VALLEY,  
MOUNT RAINIER NATIONAL PARK

interoffice trunks in any part of the exchange when the new method went into effect is indeed a source of pride for the traffic engineers. The new system was engineered correctly beyond question.

The second task of the traffic department was the training of operators and a supervisory force. An instruction force of 90 people was organized and trained. In each manual central office except Metropolitan specially wired P. B. X. switchboards were installed in order to provide a means of causing practice calls to be displayed on the call indicator training positions.

Inasmuch as the straight operation of a call indicator switchboard is very simple, no great amount of time was needed to make an operator very adept. Special care, however, was given to prepare every operator for every possible type of trouble so that there would be no hesitancy under such circumstances.

The twenty-two training positions were in use approximately 6500 hours during the training period. Five operators were trained for every call indicator position to go into service. This meant that it was necessary to train more "B" operators than there were in Los Angeles. An operator must have experience on a "B" position before she can operate a call indicator board. Therefore a number of "A" operators were given train-

ing on "B" boards and then given training on the call indicator positions.

The training was stretched over a period of five weeks and totaled ten hours for each operator.

The third division in the traffic department's work was the training of P. B. X. operators in the new methods of getting connections from dial telephones. About 1200 machine switching private branch exchanges were visited and complete instructions were given to the attendants.

The two slogans of the plant department, which were more than slogans, nearer to creeds, in the call indicator work were: "Be ready, not only on time but ahead of time," and "Make it so it can't fail."

Proof that the plant people lived these two creeds and did their work accordingly through the enormous rearrangements and almost inconceivable amount of detailed work in connection with the biggest call indicator conversion in history was found in the smoothness with which the new order of things went into effect.

The part played by the plant department will go down in history as one seldom, if ever, duplicated in the annals of telephony.

The cut was made promptly at 12:00 midnight, and fifteen minutes later, when officially complete, every call indicator trunk tested O. K. Simultaneously 2200 subscribers from Axridge, University, and Vermont offices were cut into Thornwall office without the loss of a single station, thus making the cut perfect in every detail.

To do this required months of consistent and painstaking preparation. The problem of training men for the installation and maintenance of this equipment was successfully met by the plant schools, where instruction was given to a total of approximately 225 maintenance men.

To the plant engineering department fell the part of rearranging and planning the building of the trunking system, all of which involved the handling of thousands of "T" cuts and rearrangement orders. The supply department handled more than \$1,600,000 worth of call indicator equipment, all of which was hauled to the various central offices and storerooms by company trucks.

The installation department, in addition to installing and wiring the equipment, assisted materially in putting over the job of personally instructing 76,000 subscribers in the use of the new type of equipment.





Although this latter work was begun in December, the intensive portion of it was commenced in the middle of March. Between this time and the completion of the job, which was several days ahead of schedule, as many as 250 men were engaged in instruction work at one time. The low rate of calls going to the "9-boards" after the completion of the cutover testifies to the thoroughness of this job. In addition the installation department changed many thousands of number plates and handled all necessary number changes.

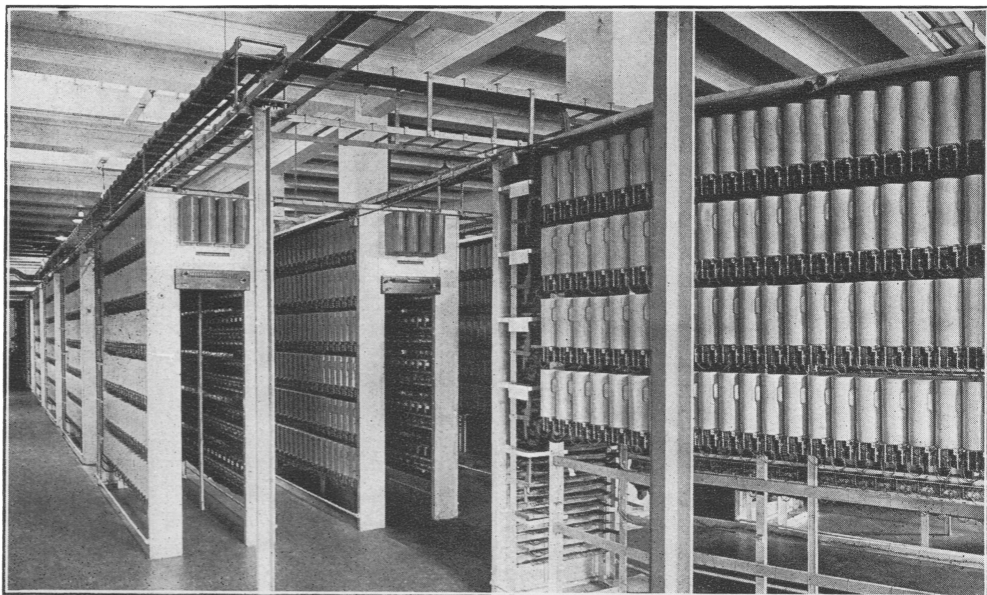
A central dispatching system was set up in the Western Electric building and through this system the progress of the cut was traced by means of specially prepared charts.

In order to insure the cutover against any possibility of unpreparedness, rehearsals were held in every central office several days prior to the final date, and when the great day arrived everything was in readiness and every man knew his duties.

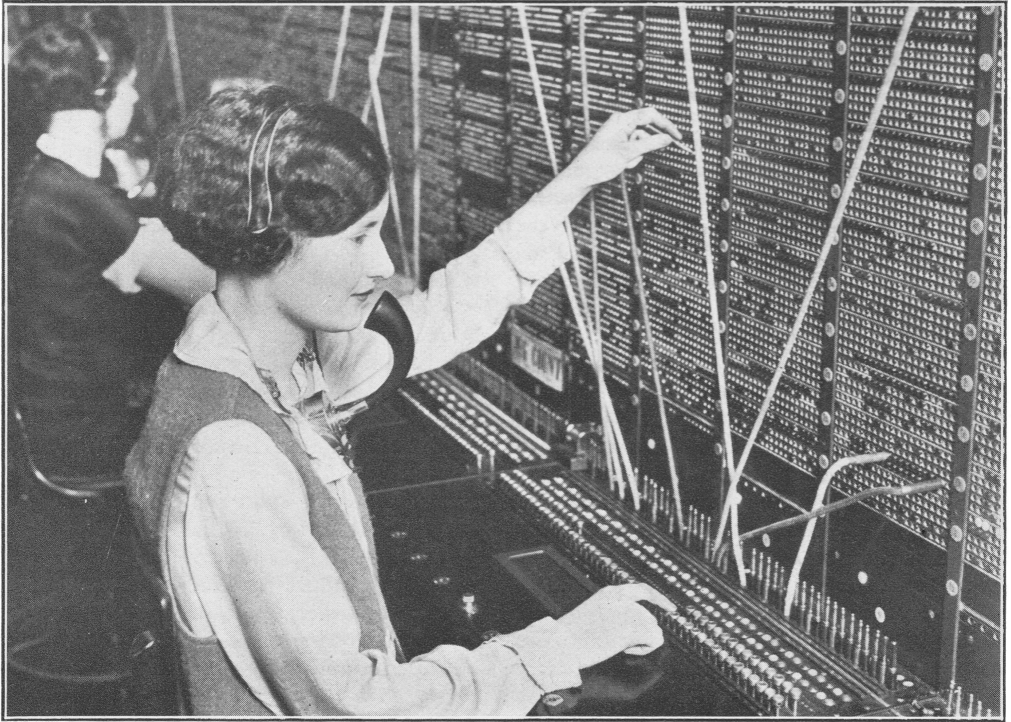
At 2 p. m. March 29 several manual offices combined in releasing forty call indicator positions and 1500 trunks for testing and by 3:30 p. m. this was completed. At 5 p. m. 185 additional trunks between downtown offices were released and converted to call indicator operations and an additional 300 trunks were released at 6 p. m., this latter being reported complete at 7:40 p. m. At

7 p. m. 1100 transfer board trunks originating in Atwater, Sunset, and Everett offices were released and these offices were completing all calls from automatic offices by connecting the incoming trunk calls direct to trunks which terminated on the regular manual boards. Manual operators answered these calls and completed them in the same manner as calls from manual stations. A total of 9800 plugs were changed on this schedule, which was practically completed by 8:30 p. m., and a little later it was announced that 50 per cent of all call indicator trunks had been built and tested. From then until 10:30 various offices reported completion of 8 p. m. test orders and at this time Atlantic office reported all trunks to manual offices as built and tested and was the first automatic office to so report. Atlantic was shortly followed by Garfield, which reported all trunks O. K. and was the first manual office to announce completion of its building and testing orders.

From 10:30 until 11:30 the various offices continued to report completions, and when 12 o'clock came everyone concerned, although nervously awaiting the outcome and holding his breath until the final report, was at least confident that an unusual record would be made, which confidence was justified to a degree that we had hardly dared to expect.



*This is a typical corner of similar equipment spread over 15,000 square feet on the first floor and known as Trinity unit, Los Angeles. Certainly nothing could be neater in appearance nor more attractive in a mechanical line than this interior.*



MANUAL OPERATOR IN THE PROCESS OF COMPLETING A CALL FROM A DIALED TO A MANUAL STATION

As a matter of interest it might be noted that the Thornwall cutover was completed in less than two minutes actual working time, which is another of those achievements which have combined to bring honor to the technical and mechanical skill of the personnel of the plant department.

Just as the work of the plant and traffic departments was greater than that required in similar conversions, in other cities—because of the great proportion of machine switching telephones in Los Angeles—the commercial department was, for the same reason, required to do an unusually large amount of work.

There was a total of 93,808 actual number changes in connection with the conversion, and service orders had to be issued in order to effect each one. Many, although by no means all, of these changes were in connection with the changing of eight manual office names to meet the requirements of the new method of operation. At the same time as the new method went into effect, ten machine switching office names were made part of telephone numbers. The old system in Los Angeles gave all machine switching telephones full numerical numbers in order to

make them easily distinguishable. These ten new prefixes replaced the first two numerals of some 42,000 six-figure numbers, resulting in typical Bell System numbers of an office name and four numerals.

In connection with these sweeping changes and in order to explain them to telephone users, more than 159,039 letters were sent to subscribers.

There were three directories issued which represented important steps in the conversion. The first was issued in August, 1923. At this time two downtown machine switching offices which resulted in changes in about half the Los Angeles business district telephones were cut into service. In connection with opening Trinity office, the biggest machine switching private branch exchange office in the world, upward of 1000 important business concerns were sold machine switching P. B. X.'s in two months' time.

The second directory was issued in January, 1924, and carries thousands of number changes due to growth and minor call indicator preparations. This was somewhat in the nature of a "clean-up-and-get-ready" directory.

The third directory, which was the largest



issue ever printed on the Pacific Coast, was the red-covered book which went into use on March 30. It contained the ten new machine switching office names and had the first two letters of every prefix capitalized in line with the standard call indicator method of operation. A total of 340,000 books was printed. Some 328,000 copies were prepared in manuscript, printed and delivered in twelve weeks. This entire directory—every listing—was reset.

The job was first mapped out and the details scheduled and divided into the main divisions, such as training of commercial employees, the issuance of orders and other details of sales work, the preparation of the directory, and the program of public education.

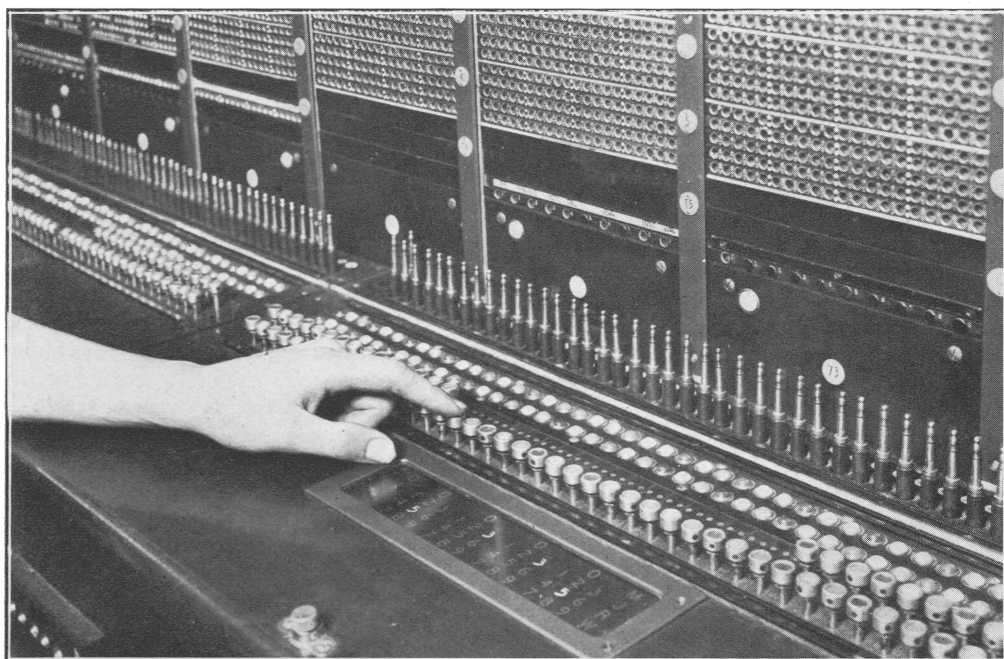
The training of employees, which commenced prior to the cutover last August, was carried on for the benefit of new employees. This work was accomplished by dividing the students into small classes and these classes met at night for instruction.

The sales work, which included the issuance of service orders, the mailing of letters and pamphlets to subscribers and the changing of records in the business office, also in the accounting department, to include the new machine switching central office names,

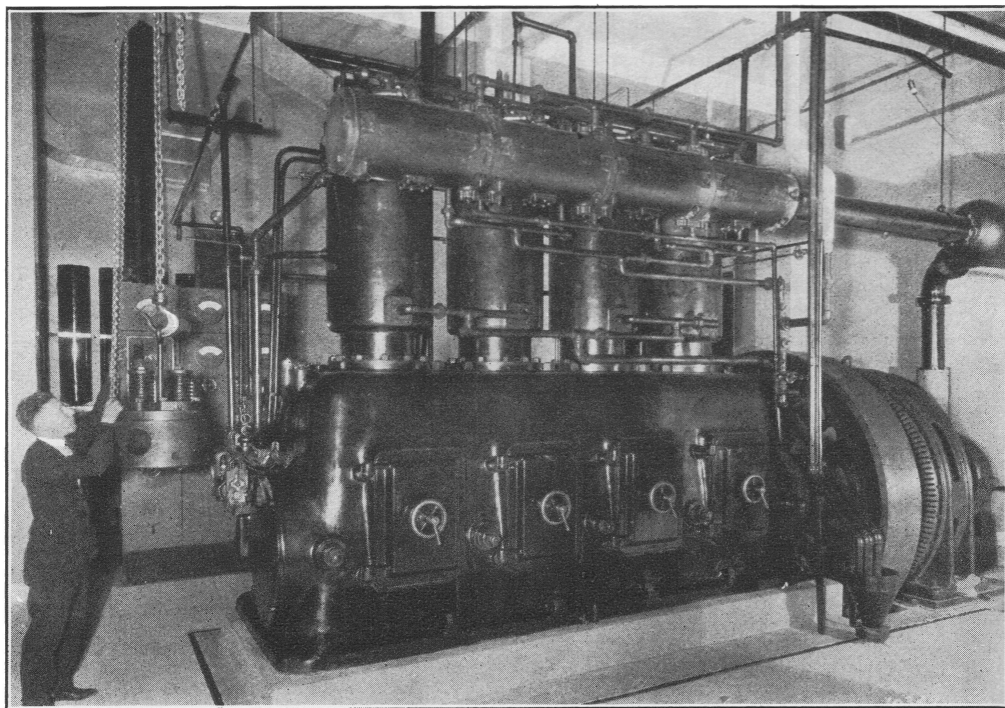
commenced early in November, 1923, and was completed well in advance of the cutover.

It is obvious that such a drastic change in the method of using the machine switching telephone would require very extensive educational work in order that the telephone-using public might be fully informed.

Accordingly, the "Big Idea" demonstration was given before schools, lodges, clubs, and other institutions, reaching a total of approximately 150,000 people between October 29, 1923, and March 29, 1924, inclusive. Every elementary, junior high, and high school, in addition to colleges, in the Los Angeles area was covered. Individual letters were written to subscribers, telling them of the change. Inserts were mailed with the January, February, March, and April bills. Instruction pamphlets were prepared and mailed to machine switching subscribers. A supply of these pamphlets was turned over to the plant department for distribution by the installation forces engaged in subscribers' instruction and for use in all new installations. Stories appeared daily in the news columns of the press over a considerable period. A series of eleven advertisements was prepared and published in practically all the newspapers of the city, including the foreign language press, during the latter part



*Here is an incoming call from a station that has dialed a manual number. You will note that the number called for is recorded on the illuminated screen before the operator in the manual office.*



*This four-cylinder gas engine in the basement of the Telephone Building in Seattle is kept in readiness at all times to operate in event of failure of outside power. The man is hoisting an extra valve head. The engine and alternator weigh thirty-two tons, or 64,000 pounds.*

of March. Letters were written to all publishers, printers, stationers, etc., advising them of the new numbering plant. As an additional precaution, men were stationed at the various newspapers on March 28 and 29 to correct telephone numbers included in advertising matter.

Employees of all departments of the company were asked to interview at least ten machine switching telephone users, explaining the new machine switching method of operation and leaving with each person interviewed a small card which explained briefly how to place telephone calls on and after Sunday morning, March 30. These cards were also distributed at various luncheon clubs and other gatherings. Demonstration equipment was placed in the business office and in the Mercantile Arcade for the instruction of the public.

The new machine switching method of operation was broadcasted over the Times, Anthony, and McPherson stations on the night of March 29 and the announcement of the new method of dialing was made at practically every church by their pastors on Sunday morning.

Billboard posters were displayed in all

parts of the city, window posters announcing the use of the red-covered directory were placed in approximately 1200 windows throughout the city and on the company's motor vehicles. Special window displays were placed in the business office windows at 740 South Olive Street.

Practically all of the picture houses of the city were made use of as an effective medium of education. Lantern slides or trailer films were thrown on the screen of practically every theater in the city at each performance for thirty days.

In addition to the 6100 column inches of paid newspaper advertising, 1798 column inches of favorable publicity regarding the call indicator conversion appeared in the papers. All but fifty-eight inches of this appeared during the month of March, when it would be most effective as public education.

In much of the publicity, special emphasis was placed on the enormous cost of installing the great metropolitan telephone system in Los Angeles, and it is believed that the part our company is playing in keeping pace with the growth of Los Angeles has been given to the public and the public mind is well satisfied.





rated as regards the proper method of using the telephone under the new metropolitan method of simplified operation.

At 12:15 a. m., Sunday, March 30, the call indicator cut was officially completed with every trunk testing O. K.

President McFarland of The Pacific Telephone and Telegraph System dialed the first call to pass over the new system. This was the closing step of the night's work.

Several hundred telephone men watched the progress of the cut in a room adjoining the plant dispatcher's office in the Western Electric Building, 608 East Ninth Street. Between bulletins announcing the work being done, entertainment was furnished by members of the telephone family and professional entertainers.

Mr. McFarland, Colonel A. H. Griswold, vice president of the Southern California Telephone Company; I. F. Dix, plant superintendent; N. R. Powley, commercial superintendent; F. N. Rush, traffic superintendent; and R. A. Gantt, chief engineer, expressed their gratification of their organizations and thanked them for the remarkable handling of the job.

Following is the message to the employees

of the Southern California Telephone Company from Colonel Griswold:

"It is with great pleasure that I extend to all employees of the Southern California Telephone Company our appreciation for the splendid job which was done in connection with the call indicator cutover.

"The results show that each of you performed your part in a manner that was a credit to you and your company. You may feel justly proud of this performance. No difficult task in the history of the Bell System was ever accomplished in a more perfect way."

△ △ △

## TREES

"I THINK that I shall never see  
A poem lovely as a tree.

A tree whose hungry mouth is pressed  
Against the earth's sweet flowing breast:

A tree that looks at God all day  
And lifts her leafy arms to pray;

A tree that may in summer wear  
A nest of robins in her hair;

Upon whose bosom snow has lain,  
Who intimately lives with rain.

Poems are made by fools like me,  
But only God can make a tree."

—Sergeant Joyce Kilmer.



"Backward, turn backward, Oh, Time, in thy flight,  
Make us all kids again, just for tonight."

So read the bulletin board in Vermont office, Los Angeles, on the morning of March 17. On the evening of March 17 this miracle actually took place. Into the retiring room came "kids" of every age and description. Some in gingham, some in aprons, some in their "party dresses," and some in overalls, for Vermont office was giving a party, and had invited as guests Alameda and University offices. The retiring room was decorated to the taste of old St. Patrick himself, and all the children wore his green caps on their heads. The horns and crickets of green made a noisy din, and green balloons added to the general merriment. The evening was filled with games and dancing. A fishpond with gifts for all the "kids" proved an attractive feature of the entertainment. Knowing that without eats no "kids" party is complete, cocoa, cake, and of course lollipops were served, and the guests departed voting the party the "best time ever."