

The

21077

(No. 3)

Santa Fe Today



The Santa Fe Today—No. 3

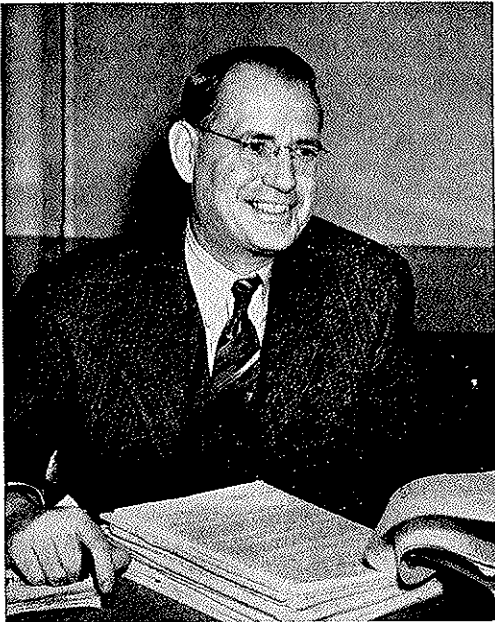
Explanatory note: Expansion of the Santa Fe from a small Kansas enterprise into a vast transcontinental transportation system has brought about many changes in its operations. This article is the **third** in a series to explain the workings of this modern railroad plant with its shops, yards, offices and other physical properties which go to make up the Santa Fe today. These articles have been prepared by Leo J. Martin of the public relations department with the co-operation of the various department heads and the editors of The Santa Fe Magazine. The remaining articles in the series will be published and distributed from month to month until all departments of the railroad have been included.

Employees are urged to retain this pamphlet and all others in the series so that at the conclusion they may have a complete story of The Santa Fe Today.

The Santa Fe Today

Communications Department

THE communications department, with J. A. Parkinson, superintendent, is that division of the Santa Fe's operating department charged with the construction, maintenance and operation of all



JAMES A. PARKINSON, superintendent of communications, Santa Fe System Lines, whose headquarters are in Chicago.

Santa Fe telegraph and telephone communications, electronics and allied research, the administration of duties incident to the Santa Fe's contract with Western Union, the operating agreements with the Bell and other telephone companies, and construction specifications of foreign line wire crossings and parallelisms on Santa Fe right of ways.

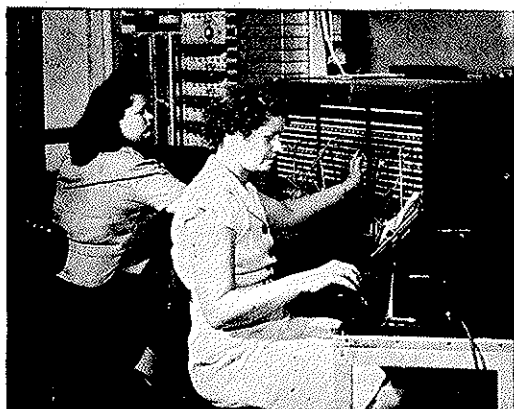
Transportation and communication are closely allied. The need of the one for the other has been so interwoven in the progress of each that it is difficult today to determine the beginning or the end of their services to each other.

Progress in railway communications has

been rapid since the days when trains moving on single track watched warily for opposing trains or waited undetermined periods for them to show up. It is difficult to visualize the complexity of details, the skill demanded and labor expended in the maintenance of pole-line networks, channels, circuits, switchboards, switching centers and relay offices; the harnessing and directing of electromotive forces and impulses; the training of the many specialists necessary to install and man the communications system of a modern railway.

The Santa Fe's communication facilities, staffed by some 3,000 Santa Fe people, comprise the largest, most modern and efficient privately owned and operated communications system in the world. Santa Fe installations include the following:

	Wire miles
13,123 miles of pole-line	
13,310 circuit miles dispatching telephone	26,620
10,734 circuit miles conversational telephone	21,468
3,403 circuit miles phantom telephone	6,806
18,229 circuit miles carrier telephone	37,458
<hr/>	
45,676 total telephone circuit miles.	92,352
1,529 miles Morse dispatching ...	1,529
20,403 miles Simplex circuit used in printing telegraph service	40,806
15,149 miles Morse circuits in railroad way service	15,149
15,695 miles Morse circuits in joint commercial way service ...	15,695
22,171 miles carrier channels in duplex printing telegraph service	44,342
18,146 miles carrier channels in multiplex printing telegraph service	108,876
<hr/>	
93,094 total telegraph circuit miles.	226,397
<hr/>	
139,770 grand total	318,749



SWITCHING CENTER with attendant.

To insure efficiency of operation and quick restoration of service impaired by any cause, the Santa Fe's system telegraph and telephone communications are directly supervised by the following officers:

- E. K. Metzdorf, assistant superintendent of communications, Topeka. System Lines
- C. O. Overbey, assistant superintendent of communications, Los Angeles. Coast Lines
- W. C. Hankison, communications manager, Amarillo Western Lines
- J. L. Lee, communications manager, Galveston Gulf Lines

Those officers are charged with the maintenance and supervision of relay telegraph offices, telephone and telegraph facilities, both inside and outside plants, and the flow of telephone and telegraph traffic within the designated territories. Each is assisted by a communications or construction engineer. Division linemen are stationed on each local operating division. Five line construction crews move about the Santa Fe system lines handling construction and repair work, a force which is augmented as the need arises.

On the superintendent of communications' system staff are an electronics engineer in charge of engineering, plan layout, tests, electronics exploration and development, and supervision of installations; a telegraph engineer supervising installation and maintenance of telegraph facilities; a telegraph traffic supervisor censoring and supervising telegraph traffic; a communications engineer supervising maintenance and manufacturing or fabrication work in the Topeka telegraph shop; a construction engineer supervising on-line construction and pole-line and line crew work; a telephone

engineer, supervising installation and maintenance of telephone equipment; and a telegraph and telephone supervisor directing installation and maintenance of equipment under the electronics, telegraph and telephone engineers.

Each Santa Fe grand operating division has a number of relay telegraph offices staffed by a manager or a manager-wire chief, a night wire chief, a late night wire chief, telegraphers, telegrapher-printer clerks, printer clerks, messengers and apprentices, who handle some 64,000,000 telegrams transmitted each year over Santa Fe telegraph facilities; and Santa Fe private branch telephone exchanges (P.B.X.) staffed by chief operators and operators who handle local commercial Santa Fe calls at terminal or population centers, and the 9,500,000 long distance calls completed annually over the Santa Fe's system-wide telephone facilities.

A chart, prepared by the communications department, governs the routing of Santa Fe telegraphic traffic directed to other railways. Commercial facilities, with some exceptions, are used for Santa Fe telegrams and telephone calls directed to Santa Fe patrons or Santa Fe offices beyond Santa Fe premises or territories. Printing-telegraph service is established with the Santa Fe's traffic offices in Boston, Philadelphia, Pittsburgh, Buffalo and Washington through a reperforator switching center located in the Santa Fe's New York offices; also Minneapolis, Milwaukee, Detroit, Cleveland, Cincinnati, Atlanta, St. Louis and Des Moines through the Chicago switching center. In



MANUEL SECTION of dial private branch exchange (P. B. X.) at Los Angeles, Cal. Left to right—Selma Peal, Marie Bowman, Marylyn Gibson, Dorothy Myers, Kathleen Root. Standing is Fannie Silverman, telephone supervisor. This is typical of the many P. B. X. switchboards maintained throughout the Santa Fe system.

addition, there is two-way printing-telegraph service between the New York offices and the Pullman reservation bureaus at Chicago and Los Angeles. Santa Fe Pullman reservation and information bureaus at Chicago, Kansas City and Los Angeles are provided with especially designed communication installations to meet the service demands at those travel centers.

On May 24, 1844, Professor Samuel F. B. Morse, flashed the first telegraph message from the United States Supreme Court in the national Capitol, "What Hath God Wrought!" This event laid the foundation for present-day communication systems. On September 22, 1851, Charles Minot, superintendent of the Erie Railway, first used the telegraph in train dispatching. The first telegraph line was of simplest type, one message being sent at a time. In 1853, Gintl, a Viennese, produced duplex telegraphy whereby two messages could be sent over a single wire at the same time, one in each direction. In 1874, Thomas A. Edison made possible quadruplex telegraphy, whereby four messages, two each way, could be sent over one wire simultaneously.

The telephone followed the telegraph by about twenty years. The United States Supreme Court decided in favor of Alexander Graham Bell as the telephone's inventor. The industry began in 1877. In 1895, Marconi produced the radio, successfully transmitting signals across the Atlantic in 1901.

Modern train operation, with its multiplicity of details, fast schedules and improved services, depends, as have train operations for nearly a century, upon the extent and quality of the railway's communication facilities. The late Edward P. Ripley, esteemed president of the Santa Fe, often stated that a railway was no better than its communications. Each step in the Santa Fe's progress has been marked by enlarged and modernized communications. In late years such modernization often has preceded other Santa Fe inaugurations dependent upon it.

Santa Fe communication facilities handle the largest volume of telegraph and telephone messages of any transportation company in the world. Almost all Santa Fe offices are serviced by either a train dispatcher's or a network telephone. Convenient intercommunication closely links all Santa Fe people, enabling them to provide exceptional service to Santa Fe patrons. Communications is a service very intimate yet intangible. In modern railroading, rapid communication is indispensable.

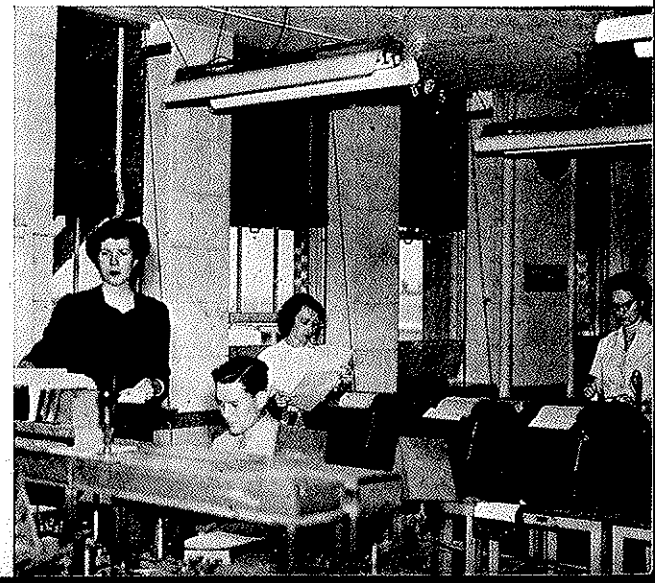


A NUMBER OF RELAY telegraph offices are maintained on each Santa Fe grand division. Above is the relay office in the general office building at Topeka.



RELAY OFFICE at Galveston, Tex.

A SECTION of the relay office in the general office building at Amarillo, Tex.



Santa Fe people are justly proud of their system-wide telephone and telegraph installations.

Since its earliest operations the Santa Fe has made use of the telegraph, the Morse code, train order signals and other features made possible by the introduction of the telegraph. Dispatcher telephone service was installed on the Santa Fe between Emporia and Newton in December, 1908. By 1911, the entire main line was equipped for this service. At one time, all Santa Fe messages were transmitted by the Morse code, which remains in important daily use. The day to day routine of transmitting local Western Union telegrams and Santa Fe company messages at small Santa Fe stations, or those not equipped with printer-telegraph, is by Morse operation. At terminals, however, and at all points where Santa Fe relay telegraph offices are located, at population centers and sizable traveling and shipping points, modern printer-telegraph and carrier current systems, using superimposed modulated frequencies (wire-radio), provide capacity and necessarily prompt service.

With multi-channel carrier equipment, the newest improvement in telegraphy, the Santa Fe has added onto two properly transposed copper wires, up to three trunk lines or through telephone circuits, or, where desired, two through telephone circuits and up to fourteen duplex printing-telegraph circuits. For example, two copper wires used for telephone train dispatching, properly transposed, may be used to carry simultaneously as many as three other conversations or two other conversations and as many as twenty-eight (fourteen each way) printing-telegraph messages without

interfering with the normal use of the wires for train dispatching.

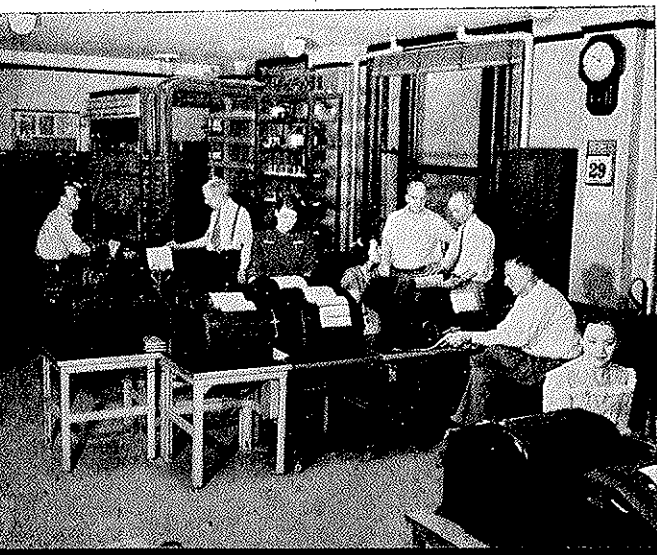
Multi-channel carrier equipment, 30 kc. (type C), as installed on the Santa Fe, extends from Chicago to the Pacific Coast and to Galveston. Separate units connect Chicago with Topeka, Topeka with Fort Worth, and Fort Worth with Galveston. Another branch connects Topeka with Amarillo, and another, Amarillo with LaJunta. The latter is connected with Topeka and Albuquerque over the northern route. Amarillo in turn is connected with Los Angeles and the latter with San Francisco.

This equipment is the first to combine both wide and narrow band circuits in the same speech frequency channel. Between Topeka and Chicago, for example, there are seven narrow band channels for single teleprinter working, spaced at 150 cycles with intervals beginning at 525 cycles, and these three wide channels for multiplex working at 1950, 2250 and 2550 cycles. In other sections throughout the Santa Fe system there are various combinations of wide and narrow channels. At predetermined intervals on each circuit, repeating amplifiers raise the level (voice) of all channels to a high quality of uniformity. On a Chicago to Los Angeles call this amplification takes place at Corwith, Streator, Shopton, Marceline, and at similar intervals across the country.

The printing-telegraph machine is commonly called teletype or teleprinter. Having a standard typewriter keyboard, it has a maximum transmitting capacity of around sixty words per minute. Printing-telegraph machines are located in ninety-six printer offices throughout the Santa Fe system. Such important items as wheel-reports, advance switch lists, and data included in the main line red ball freight reporting system are transmitted. Often Topeka, Chicago and terminals lying ahead of a train know the train's exact contents, the location of the cars in the train, icing, switching and other services to be given cars before the train has left its originating terminal.

Reducing terminal detention of through trains is a matter of first importance in the reduction of the turn-around or disposition time of freight and passenger cars. Yardmasters, with the aid of accurate advance information, may plan their switching operations and begin working the train immediately upon its arrival. Wherever switching is expedited, yard capacity is increased. Handling of diversions to carload freight is an important service dependent

TYPICAL of the on-line relay offices is this one at Newton, Kan.



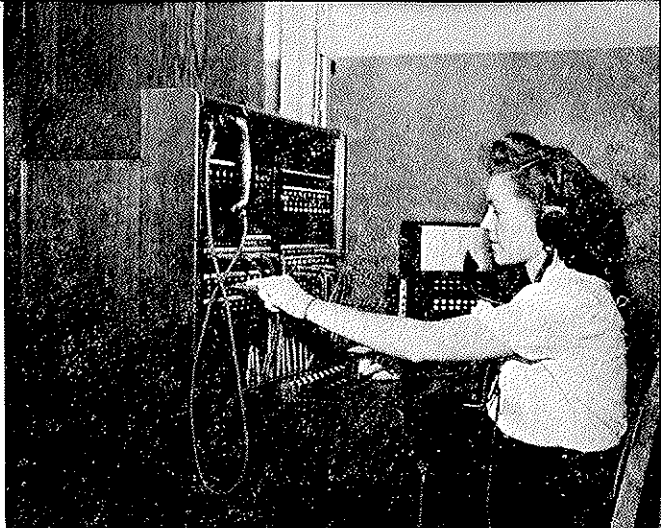
on prompt communications. Delivery of freight to consignees and to connecting railways at Santa Fe junctions is speeded up by advance notice which permits all concerned to prepare for such delivery. The telegraph department has explored all Santa Fe operation and traffic phases to determine where and to what extent improved communication facilities may prove beneficial.

At Los Angeles, San Francisco, Winslow and Fort Worth manual relaying of Santa Fe telegraph traffic has been eliminated by the use of carrier current telegraph channels and the installation of switching centers. All teletype circuits within the area served by a switching center terminate in a switchboard. Switchboards serving the various centers are linked by trunk lines. One Santa Fe printer office is connected with any of the ninety-six system printer offices for direct service; or one office is connected with as many as six offices, transmitting simultaneously a multiple addressed message to all six points; and, at the same time, receiving a message from any one of the offices to which transmission is being made or from any other printer office on the line.

At Santa Fe switching centers teletype connections are effected in a manner similar to telephone calls passing through a private branch exchange. A Santa Fe office signals the switching center attendant, who determines the other office desired and sets up the connection. At conclusion of transmission, the sending office gives a disconnect signal and circuit is restored to normal. If desired, the switching center attendant may connect a receiving teletype at the center to obtain a copy of the message.

An originating office need not wait for a particular circuit. When a desired circuit is busy, the calling office is given a reperforator which perforates the message on a tape by which it is transmitted when circuit is available. Santa Fe switchboards and auxiliary transmitting positions associated with them are equipped with supervisory lamps. These show the manner in which the various terminating circuits are being utilized. Teletype switchboard circuits are designed for full duplex method of operation, permitting two simultaneous messages, one in each direction. This makes possible the sending of a message to one office and, at the same time, to receive a message from that office or another one, an exclusive Santa Fe feature.

Modernizations have not changed the types of Santa Fe inter-company messages



THIS LOCAL private branch telephone exchange is located at Newton, Kan. Eleanor Jo Carpenter is the P. B. X. operator.

which, classified in the order of importance, are: wire messages, concerning wire communications, breakdowns, impairments, taking preference over all others; pink messages, concerning vital or urgent matters, filed over the signature of designated Santa Fe officers and restricted in various ways; preferred messages, concerning subjects requiring immediate and preferred attention; day messages, subordinated to preferred when better service is not necessary; night messages, to be transmitted when the delivery of the telegram on the following morning will satisfy the service demand.

It is the duty of the telegraph traffic supervisor to study various messages filed, to the end that telegraph service be restricted to matters demanding immediate attention and that wording be brief and concise. Reports are checked to see if they can be consolidated, shortened or eliminated. New or revised telegraph report-forms are submitted to the superintendent of communications for approval before being adopted.

Vigilance must be an outstanding characteristic of a Santa Fe telegraph operator. In addition to Santa Fe operating department rules and regulations, operators are governed by communications department rules. Morse operators are cautioned to send firmly, space carefully and to take due precautions in transmitting messages. Santa Fe history is replete with tales of telegraph operator heroism. There was a time, not too long ago, when a town's only communication with the rest of the world was the railway agent's telegraph key. Despite the addition of highways, telephones, and increased population, it takes only a flood or a tornado or some other devastation by the elements to bring local and rural resi-

dents scurrying to the nearest railway depot. Everything may be isolated, but those citizens know that the operator and his railway, of all organizations serving the community, will be the first to establish communications and to bring in relief where relief is needed. There is scarcely a newspaper printed that does not carry a quantity of material relayed in part by a railway Morse operator.

To provide uniform practice in the handling of printer-telegraph traffic, the Santa Fe's communications department has pre-

Newton, Wichita, Chanute, Oklahoma City, Arkansas City, Hutchinson, Dodge City, Wellington, Denver, LaJunta, Pueblo, Clovis, Belen, Las Vegas, Albuquerque, Winslow, Stockton, Barstow, Needles, Bakersfield, Richmond, Phoenix, Fort Worth, Dallas, Houston and Temple. Others are in the process of installation.

Long distance company calls are set up in the order in which they are placed; if call is of an emergency nature, request is made upon persons using circuit to surrender it, the line being returned after emer-



PRINTING-TELEGRAPH machines are located in 96 printer offices throughout the Santa Fe system. Such important items as wheel reports, advance switch lists, and data included in the main line red ball freight reporting system are transmitted. Here is a close-up of a printer in action, receiving.

pared an instructive *Printer Routine*. Those handling such traffic are guided by the provisions it contains which concern the message itself, its classification and identifying symbols, order of transmission, alterations and corrections, multiple messages, perforators, procedure at switching centers, and many other factors regarding use of facilities and steps necessary for the prompt, accurate and complete transmitting of messages and reports.

Special rules govern the operation of the Santa Fe's private branch exchange. Switchboards at Chicago, Topeka, Kansas City, Galveston, Amarillo, San Bernardino, Los Angeles, San Diego, Fresno, Oakland and San Francisco handle a volume of calls necessitating sizable facilities at those locations. Private branch exchanges are installed at Shopton, Chillicothe, Emporia,

agency call is completed. Long distance calls of more than five minutes' duration are closely supervised and every effort is made to prevent unnecessary tying off of circuits.

To facilitate the announcing of train arrivals and departures, public address systems are installed at Albuquerque, Barstow, San Bernardino, San Diego and Pasadena, similar to such facilities at the Kansas City, Los Angeles, and other union stations. Address systems are set up at other Santa Fe locations whenever necessary to direct crowds and to make general announcements in relation to special events.

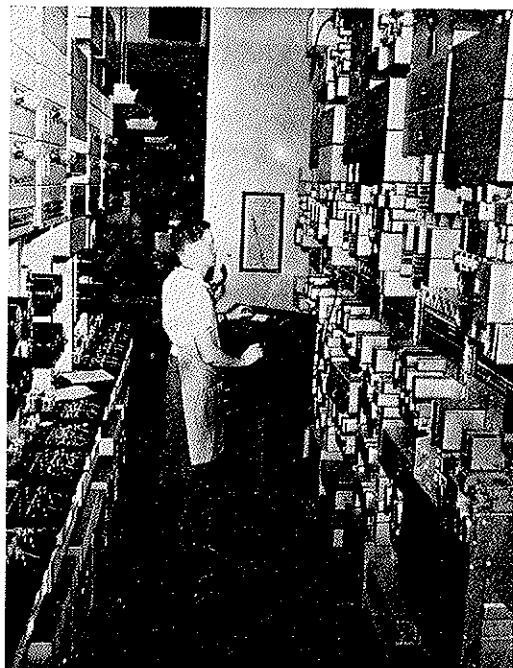
The Santa Fe has the distinction of having operated the first transcontinental train using radio end-to-end communication, the celebrated "spud" special from Bakersfield to Chicago. In the field of electronics, which made possible the establishment of the

Santa Fe's telephone network, constant study and observance is under way. Some very intricate and highly efficient circuit designs, including the use of vacuum tubes in place of electrically operated mechanical relays, have been developed in the department's shops. There have been many tests in the exhaustive efforts under way to develop practicable use of radio-telephone communications with moving trains and terminal operations.

The practicability of utilizing facsimile or telephoto in railway service has been investigated. Admittedly a development which will occupy an important place in the railway communications field, research has not developed sufficiently to forecast to what extent telephoto may be used advantageously.

Santa Fe people may take pride in the fact that commercial communication systems as well as those of other railways have examined and commended Santa Fe communications. Not only has the Santa Fe pioneered in many phases of railway communications but it has anticipated developments and prepared for their introduction. Santa Fe engineers foresaw the application of high-frequency multi-channel operation to its services some years back and set about transposing and otherwise preparing Santa Fe communications lines for that purpose. As pole-lines were worked over or rusted, iron wire was replaced by copper, the telephone circuits were transposed to accommodate 30-kc. operation. Such work had the added advantage of materially improving the quality of voice transmission over the physical and phantom circuits.

Maintenance rearrangements and construction of pole-lines, wires and cables is directed by the communications depart-



CARRIER TERMINAL BAYS at Topeka.
Ora V. Albright, assistant wire chief.

ment's construction engineer. The work is done by division linemen and telegraph crews. Division linemen also maintain all inside and scattered equipment outside of the relay offices.

The division linemen are notified of any interruptions to service by wire chiefs in Santa Fe relay offices. Working under the direction of the construction engineer and assistants on the respective grand divisions, these linemen make ordinary repairs without delay, reporting interruptions which they cannot handle.

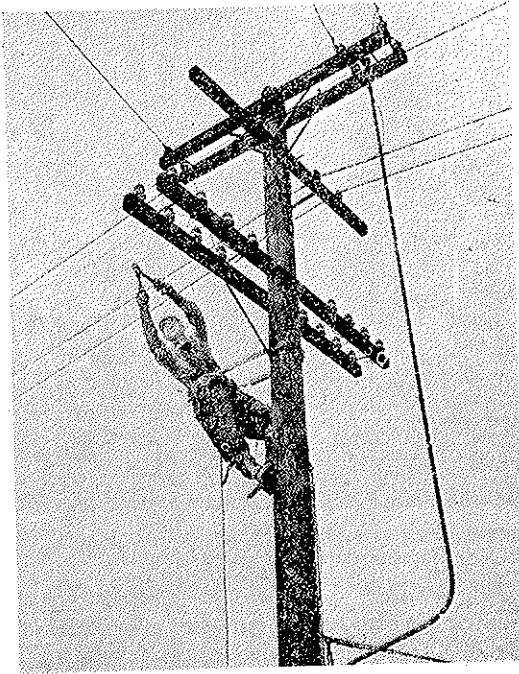


A LOCAL telegraph operator, E. A. Andrews of Devore, Cal., talking over dispatcher's telephone.

All outside plant work is performed according to very complete specifications furnished by Western Union. Pole-line specifications embody all linemen's experience in

brackets the telephone circuits used for carrier systems. Carrier circuits will not operate successfully without such transposing which is essentially a complicated engineering problem and demands the highest skill of the lineman's art.

The task embraced all main line routes Chicago to Newton, Newton to Belen via the northern and southern districts of the Santa Fe's Western Lines, Belen to San Diego, Newton to Galveston and various side line routes. Since the wires are transposed every 260 to 520 feet, every pole in

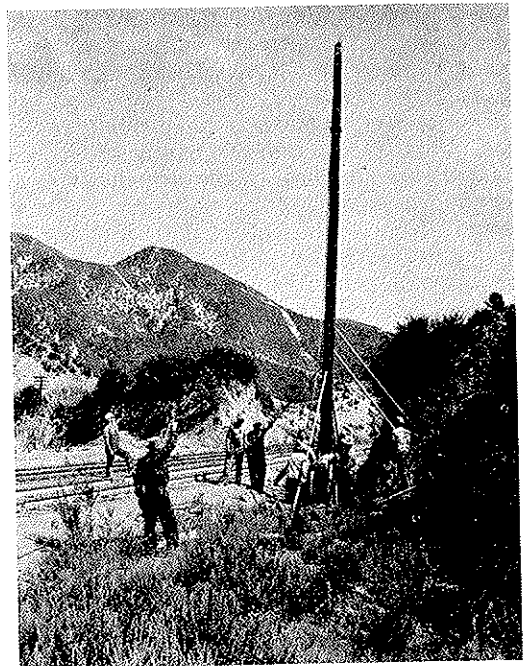


A DIVISION LINEMAN on pole line work. Serving under the direction of the construction engineer and assistants on the respective grand divisions, these linemen make ordinary repairs without delay, reporting interruptions which they can not handle.

regard to the various localities and are changed from time to time when experience deems it necessary. Division linemen operate motor cars to the scene of the trouble. They are qualified linemen, able to handle a variety of repairs. When they cannot do so, arrangements are made to rush special crews to handle the difficulty. Heroic services have been rendered by division linemen who brave all manner of climatic conditions and often labor extended hours to restore service.

Each telegraph crew is directed by a foreman who handles all classes of line work, submits reports and sees that work is performed according to specifications. He must be prepared to meet any emergency. He is chosen for his knowledge of line work, ability and reliability.

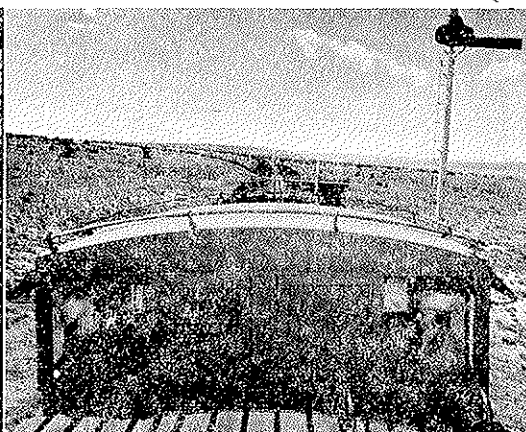
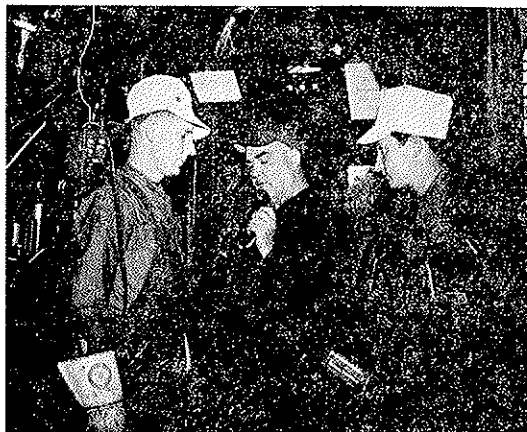
In late years, the telegraph line crews have handled the important task of conditioning the Santa Fe's wires for the high frequency or carrier current system. The work consisted of transposing on point



TELEGRAPH CREW working on line. Each crew is directed by a foreman who handles all classes of line work. He must be prepared to meet any emergency.

the line had to be worked—a huge and lengthy task which has contributed much to the Santa Fe's outstanding position in the private communications field.

Pole-lines, built in the open, are of a suspension type of construction and are subjected to the most adverse weather conditions. Ice loading, wind and water are the three major causes of pole-line and wire prostrations. The prostrations caused by these elements seem to follow in cycles striking in about the same areas with regularity. Wire reports of complete prostrations and weather conditions are made promptly day or night to the superintendent of communications, the construction engi-



THE DISTINCTION of having operated the first transcontinental train using radio end-to-end communication is held by the Santa Fe, the celebrated "spud" special from Bakersfield to Chicago. At left, the engine crew and brakeman in the cab are shown inspecting radio telephone. Although the head end of the train is out of sight, the conductor, shown at right with phone, has no difficulty passing information to the engineer.

neer and assistants on the grand division. Steps immediately are taken to restore service.

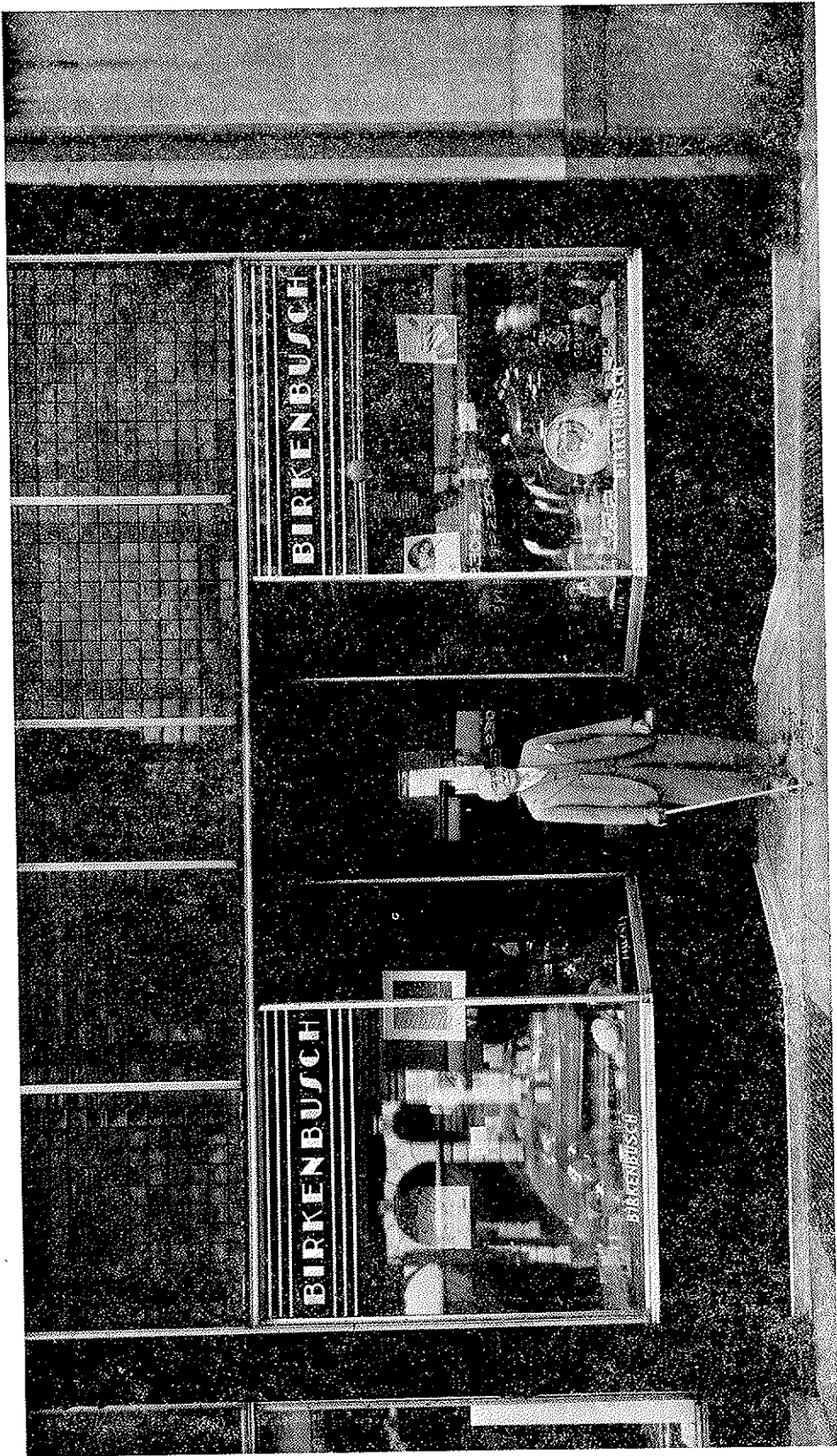
Certain sections of the Santa Fe's lines, Newton-Dodge City, Garden City-Holly, Lamar-LaJunta, LaJunta-Pueblo and LaJunta-Trinidad on the northern transcontinental route, and Wellington-Kiowa, Woodward-Canadian, Pampa-Amarillo, and Amarillo-Black on the southern transcontinental route, regularly are subjected to storms. The flash trouble-reports when received, connected as they are with preattained knowledge of the particular locality, tell the story for the communications department's experienced engineers. Crews and proper materials for permanent repairs are dispatched even as the line is being covered for emergency restoration of services. Periodic storms and floods as well as brush fires and an occasional forest fire strike other Santa Fe areas. So broad are the Santa Fe's communications facilities, however, that the closing of one through route

ofttimes can be temporarily offset by using alternate routes.

Because they make possible the quick exchange of intelligence, the telegraph and the telephone set in motion forces which otherwise would be static for long periods. The telegraph not only opened a new operating world to the railways but it inaugurated scientific, educational and social advantages so profound that the lives of all civilized people were almost abruptly changed.

Many possibilities in the electronics field lie ahead. The tiny electrical particles revolving around each atom are being harnessed and controlled as never before. Electron tubes have given us electric surgery, sound pictures, radio, and television. They enable us to smell odorless gases and to see through fog and darkness. They are daily assuming a more important position in railway operations as attested by the Santa Fe's communications facilities. The progress of the latter will be watched with interest.





HENRY BIRKENBUSCH, local watch inspector at Pekin, Ill., in front of his store. Mr. Birkenbusch is 94 years old and has been a local watch inspector since 1908. He is the oldest watch inspector both in point of service and in age. Born in Baltimore, Md., on December 23, 1851, he was employed by J. J. Woelfe, Jeweler in Pekin, on May 25, 1867; bought out the latter's interest in 1887, took his son, Louis, as partner in January, 1929, and has been in the same location now more than 78 years.

Time Service Department

THE time service department, under the direction of A. J. Strobel, general watch and clock inspector, Topeka, is responsible for the inspection of watches used by designated classes of Santa Fe employees in the performance of their duties; the maintenance of all clocks and instruments with timing devices owned by the Santa Fe; maintenance of records pertaining to those watches, clocks and instruments; sending of daily time signals; general surveillance of established time facilities throughout the Santa Fe system lines.

Time is an important factor in railway operation. It must always be under control and always available. Each element or circumstance contributing to its establishment and maintenance throughout the railway's premises must be understood and properly regulated. Not only a railway's operations but many communities depend upon railway

time, correcting or obtaining their time from standard railway clocks. State and municipal officials often call on the railways for help in the matter of time, knowing that they may depend upon such services rendered them by the railway.

The Santa Fe's general watch and clock inspector, with a force of twelve watch and clock repairmen, a chief clerk and five clerical assistants, assumes the responsibility for time and time facilities on the Santa Fe. Exacting records are maintained in the general watch inspector's Topeka offices. Watch and clock inspection and repair shops are maintained at Topeka and San Bernardino.

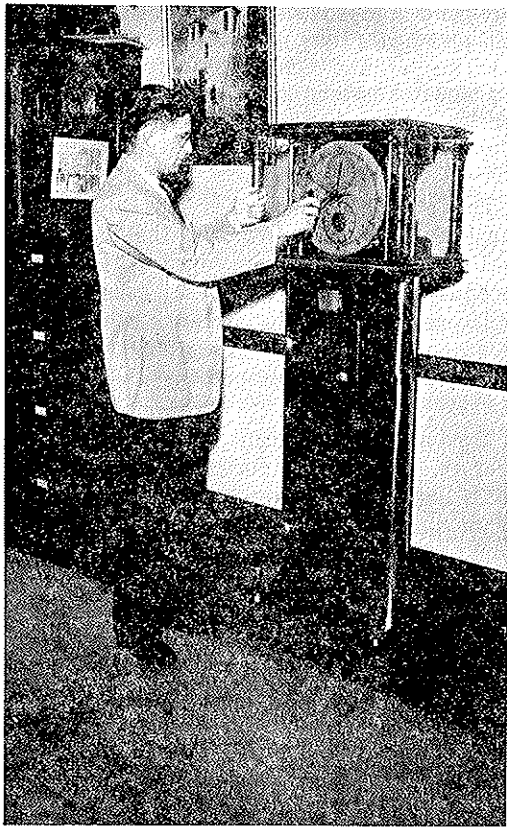
The Santa Fe, throughout the system territory, has contracted with 155 local jewelers, designated as regular local watch inspectors, who handle mandatory watch inspection for the following classes of Santa Fe people engaged in train, engine and yard service:

Yardmasters, assistant yardmasters, conductors, enginemen, brakemen, firemen, foremen of yard engines, switchmen, outside hostlers, engine herders, pilots, and such other employees as may be designated by special instructions.

The Santa Fe has contracted with 105 additional local jewelers throughout the system territory at points where train, engine and yard service men do not tie up, who handle necessary watch inspection for the following classes of Santa Fe people in roadway and station service:

Roadmasters and track supervisors, inspectors of track and roadway, section foremen and assistant section foremen, extra gang foremen and assistant extra gang foremen, bridge and building foremen and assistant bridge and building foremen, water service foremen and assistant water service foremen, traveling motor car repairmen, telegraph foremen, division linemen, signal foremen, signalmen and signal maintainers, agent-telegraphers, telegraphers, agent-telephoners, telephone operators (except switchboard operators), towermen, and all other operating motor cars.

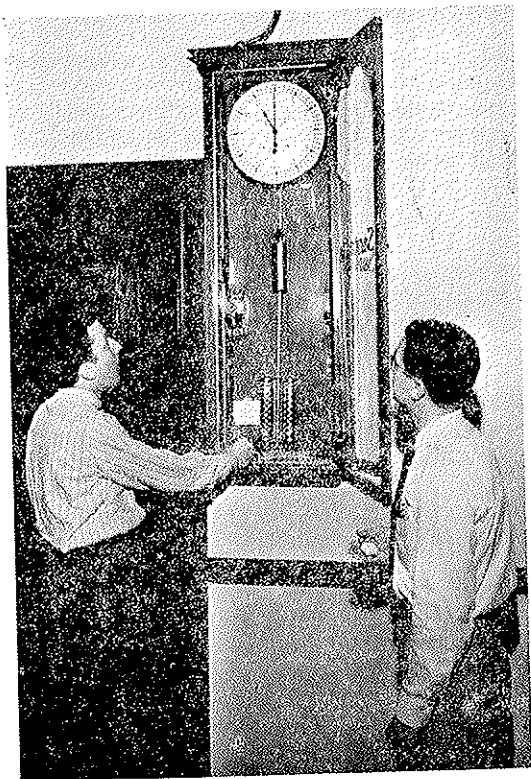
Each regular and local jeweler under contract is permitted to display a sign in his store window denoting that he is an official Santa Fe watch inspector. He is privileged to sell watches, chains and charms and to do watch repair work on Santa Fe pay roll deduction orders. Many of the local inspec-



THE STANDARD CLOCK may be said to be the heart of time service on the Santa Fe system. Here A. J. Strobel, general watch inspector, is shown winding the master clock.

tors have long periods of service to the Santa Fe and its people.

There are approximately 19,000 watches in the service of Santa Fe people who are required to comply with time service rules.



SENDING TIME SIGNALS. E. D. Allard, office watchmaker, sending time signals on master clock in general watch inspector's office, with R. W. Gooch, chief clerk, standing by making comparison with his watch. Signals are sent daily by telegraph at 11:00 a. m. Central Time, 10:00 a. m. Mountain Time, and 9:00 a. m. Pacific Time, which are the standard time authorities governing specified geographical areas within the Santa Fe's transcontinental territory.

A crew of two or more traveling watch inspectors is almost continuously engaged in rating those watches. It is a Santa Fe policy to give each watch a position rate test at least once every two years. The traveling inspectors are supplied with lists of each Santa Fe person on each local operating division who is required to comply with time service rules and who has not had his watch rated during the current year. Rating days are bulletined prior to the arrival of the inspectors.

The Santa Fe owns some 4,000 clocks, and instruments with timing devices. Those include standard clocks with mercurial pendulums; station and office clocks, time recording clocks for recording hours of

service; engine lever and fine lever clocks for movable locations, used on Santa Fe official business cars, tugboats and various test cars; impact recorders, used for detecting rough handling of trains; stop watches, used by the operating, mechanical and engineering departments in various tests; baggage checks, and other items. Most of the instruments with timing devices are forwarded to the Topeka shop for repairs as are all system clocks requiring major overhauling. A force of clock repairmen move about the Santa Fe system cleaning and effecting repairs and adjustments to the clocks on line.

The first three numbered rules in the Santa Fe's Rules and Regulations, Operating Department, have to do with Standard Time. The standard clock mentioned in those rules is probably the most important time piece over which the time service department has supervision. It is a large clock with two cut glass jars in its pendulum, each jar containing approximately six pounds of mercury. The mercury compensates for the contraction and expansion of the pendulum rod, which is influenced by cold and heat, thus avoiding the raising or lowering of the center of gravity. There are approximately 210 standard clocks in service on the Santa Fe, located at points where train, engine and yard men go on and off duty.

The standard clock may be said to be the heart of time service on the Santa Fe system. The clock is equipped with sweep seconds-hand and dead-beat escapement, which means that the sweep seconds-hand is stopped dead on every second. This is probably the best escapement known for clocks.

Yardmasters, assistant yardmasters, conductors, enginemen, foremen of yard engines, outside hostlers, engine herders and pilots must, before commencing each day's work, compare their watches with a standard clock and register on a prescribed form. If a standard clock is not available, correct time must be obtained from the train dispatcher or from some conductor or engineman who has recently made such comparison. Conductors and enginemen, and foremen and enginemen of yard engines, must compare watches with each other before starting each day's work and assure each other that their watches have been wound at a time which will insure their running at least sixteen hours. Brakemen, switchmen and firemen must compare

watches with their conductor, foremen or enginemen at first opportunity.

Each Santa Fe office having a standard clock keeps a daily record of its performance, comparison being made with the time signals which are sent daily by telegraph at 11:00 a.m. Central Time, 10:00 a.m. Mountain Time, and 9:00 a.m. Pacific Time, which are the standard time authorities governing specified geographical areas within the Santa Fe's transcontinental territory. Those signals are received daily in the office of the general watch inspector at Topeka, from 10:57 a.m. to 11:00 a.m. Central Standard Time by Western Union telegraph from the U. S. Naval Observatory at Washington, D. C. If necessary, the master clock in the general watch inspector's office is corrected to agree with Standard Time; the time signals then are sent from this clock to all telegraph offices on the Santa Fe system.

This procedure, one of the most vital of Santa Fe practices, is as follows:

10:57:00 a.m. Second beats commence and continue until the 28th second inclusive, when circuit opens until

10:57:30 a.m. When second beats commence again, continuing to the 54th second inclusive when circuit opens until

10:58:30 a.m. When second beats commence again, continuing until the 28th second inclusive, when circuit opens until

10:58:30 a.m. When second beats commence again, continuing until the 54th second inclusive, when circuit opens until

10:59:00 a.m. When second beats commence again, continuing until the 28th second inclusive, when circuit opens until

10:59:30 a.m. When second beats commence again, continuing to the 49th second, inclusive, when circuit opens until

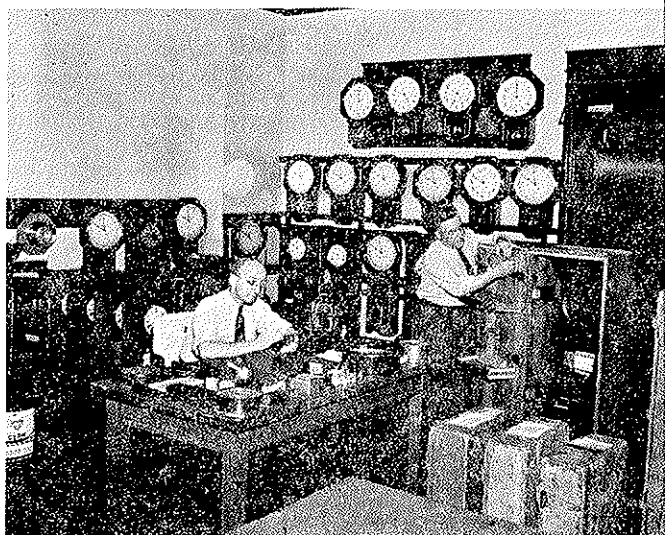
11:00:00 a.m. When the circuit closes one dot, and then opens again, when all repeater switches should be thrown back to original position.

The program affords ample opportunity to identify the minute and second so that operators at all telegraph offices can compare their watches and know definitely how much they vary from the correct time. Should there be a failure in receiving the time each day, operators are required by rule to secure the correct time from the train dispatcher. In those offices where standard clocks are located, the operator on duty must placard the clock if it is less than nine seconds in error or set the clock if it is more than nine seconds in error.

A daily record of each clock's performance is made and sent monthly to the gen-

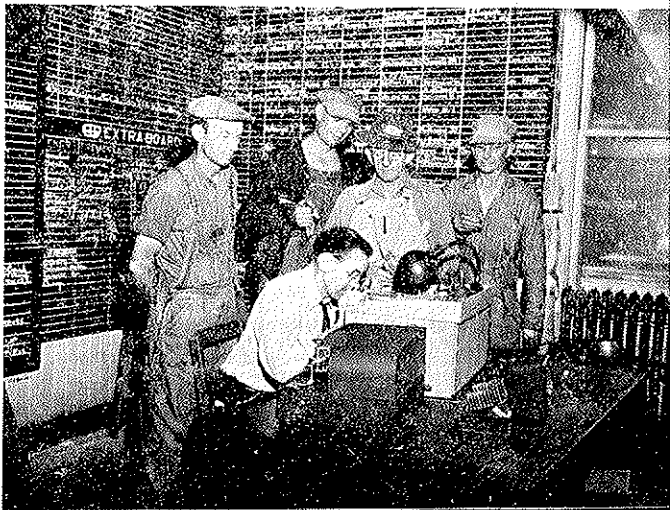


RATING AND ADJUSTING watches in office of general watch inspector, Topeka. F. J. Miller, office watchmaker, is shown at the watchmaster, a delicate instrument which first discloses the movement in the stem up, dial up and dial down positions.



TOPEKA CLOCK SHOP. Charles E. Amick and M. C. Larsen, traveling watch inspectors, working with various types. Practically every type of Santa Fe clock is pictured.

RATING WATCHES on line with watchmaster. F. R. Bauman, traveling watch inspector, with switch crew at yard office. Left to right—A. H. Baxter, brakeman; W. E. Hyatt, fireman; F. A. Rimmer, conductor; F. M. Roberts, engineer.



eral watch inspector's office where it is studied in detail. If a clock is not performing satisfactorily, arrangements are made for adjustments or repair. Each operator in charge of a standard clock has a pendulum chart explaining how to correct minor variations by use of small weights placed on the bottom or top pendulum bar—on top to advance the time, on bottom to retard it.

The Santa Fe's time service rules are divided into two sections, applicable to groups in train, engine and yard service, and those in roadway and station service. The make and grade of watches which are accepted as standard are the same for all classes of Santa Fe people who are required to comply with time service rules. A watch, to be designated as standard, must meet the following specifications:

American make, 16 size, lever-set, 19 jewels or more, open-face, winding at "12", double-roller escapement, steel escape wheel and micrometer type regular, adjusted to temperature, isochronism and five or more positions, which will rate within a variation not to exceed six seconds in 72-hour test and regulated to run within a variation not to exceed thirty seconds per week. A watch bearing other than a standard trade name or trade number will not be accepted. Various Elgin, Hamilton, Hampden, Howard, Illinois, South Bend, Waltham and Ball makes are designated as standard.

All Santa Fe groups are required to comply with the same regulations in regard

to having their watches certified by the system general watch inspector, and cleaned every eighteen months. After repairs have been made which may interfere with former position adjustments, such watches are re-certified for service after having passed rate test in the Topeka or San Bernardino office or by one of the traveling watch inspectors.

The rules for the two classes differ in that those in train, engine and yard service are required to present their watches between the first and seventh of each month to a local watch inspector for inspection and registering. If the first of the month falls on a Sunday or holiday, the watch may be registered on the last day of the preceding month. Registration sheets, compiled by the local watch inspector, are sent to the trainmaster who checks them to assure that all who are required to do so have complied.

Santa Fe people in the roadway and station service groups are required to have their watches certified by system general watch inspector the same as do those in train, engine and yard service, but are not required to present their watches regularly to a local watch inspector for inspection and recording. Many roadway and station people work at points where there is no jeweler or qualified watch inspector.

The trainmaster records the cleaning of watches of the train, engine and yard service groups. Time service rules provide that the individual is responsible for cleaning



WRAPPING WATCHES for shipment from general watch inspector's office. Approximately 100 watches are mailed weekly by the Topeka shop, carefully packed and expressed; also a variety of clocks and miscellaneous time and recording machines which the shop either repaired or is sending on a temporary basis. Left to right, seated—Mrs. Vera F. Hadsell, Miss Ethel L. May. Standing—Miss Barbara Thomson, Miss Marjorie Zwonitzer, Mrs. Hazel G. Diebenbrock, Miss Bonnie Hunt.

statement being mailed to his employing officer on or before the last day of the eighteen-month period. The cleaning dates are recorded in the trainmaster's office and are sent to the general watch inspector at Topeka where they also are recorded. The trainmaster does not record the cleaning of watches carried by Santa Fe people in roadway and station service. The roadway and station service employees are responsible for their cleaning statements being mailed to general watch inspector on or before the close of the last day of the eighteen-month period.

When a watch in railway service is damaged to the extent repairs are necessary which alter its position adjustment—fitting balance staff, vibrating hairspring and other work—the watch must be examined and given position rate tests in either the Topeka or San Bernardino shops of the general watch inspector or by one of the traveling watch inspectors.

The rate test is made on a delicate instrument known as the "Watchmaster" which produces a chart showing the actual performance of the watch in various positions. These tests are made in stem up, dial up, dial down, stem right and stem left positions. The Watchmaster tests include checking the performance with the mainspring partially wound and with the spring fully wound. These examinations and tests are made by experts to assure that each watch is in proper mechanical order for railroad service.

Watchmaking is a delicate art, requiring patience and skill. An office watchmaker, in shop parlance a foreman, is in charge of the nine watch and clock repairmen located at the Santa Fe's Topeka shop or on traveling assignments over the system. There is an office watchmaker in charge of the San Bernardino shop, the Coast Lines territory, who is assisted by a traveling watch inspector and clock repairman. The Topeka force assists the Coast Lines when the work is heavy. All traveling watch and clock inspectors and the San Bernardino office report to the Topeka office on work done and the necessary records are handled by the Topeka office. There is considerable work involved in the detailed records supervised by the chief clerk who assists in distributing work to the watch and clock repairmen and arranging their itineraries. Stock requirements of the delicate and valuable materials used in the maintenance of all timing devices must be foreseen. Local



A. J. STROBEL (right), general watch inspector, compares time with an engineer and conductor. Time is an important factor in railway operation.

watch inspectors must be supplied with the required forms for handling watch inspections.

A complete record is kept in the office of the general watch inspector of each watch in Santa Fe service, including the name, occupation and address of the owner, his file number, the division on which he is employed, make of watch, size, number of jewels, grade and movement number, date the watch was last cleaned and by whom, date last given position rate tests, date of time service approval card and to whom it was sent for delivery. There are over 100,000 watch cards on file in the general watch inspector's office—watches that have been and are in official Santa Fe service. The names of many past and present-day Santa Fe officials are among the number, particularly in the operating department, who in years gone by occupied positions subject to the time service rules.

Each division office reports to the general watch inspector the names of those employees who are required to comply with time service rules—when they enter the

service, when they leave, as well as promotions and transfers.

Each new employee in Santa Fe train, engine and yard, and roadway and station service, is presented with a book of rules governing time service, in addition to such other rule-books as apply to his particular branch of the service. Many of the newly hired employees own a standard watch at the time of employment, and any who do not, must comply with time service rules by procuring a standard watch. All watches entering service must be certified by the office of general watch inspector, and watches so certified are passed for service with a time service approval card which shows the date the watch was last cleaned, or new, and the date it will be due for cleaning. Approximately 25,000 time service cards are issued yearly by the general watch inspector.

The local inspectors usually instruct their wholesalers to send new watches directly to the general watch inspector at Topeka or San Bernardino, where they are given a position rate tests. In normal times, most of the local watch inspectors have in stock new railroad grade watches which have already been rated and tagged to indicate they have been assigned to his rated stock and given a stock number. When an employee arranges with him for a watch he merely reports to the general watch inspector the stock number of the watch sold, and a time service approval card is issued by the Topeka office.

Approximately 150 watches are mailed weekly by the Topeka office carefully packed and expressed; also a variety of clocks and miscellaneous time and recording machines which the shop either repaired or is sending on a temporary basis. The time service department has all types of clocks available for relief purposes, also loaner watches. Every precaution is taken throughout the system lines to have time accuracy and time availability conveniently present at all times.

There are additional rules in regard to standard watches. They must be protected with suitable guard or chain. The dial must be 12-hour railroad model, bearing heavy

black Arabic numerals in upright position and in good condition. The crystal must be replaced when cracked, badly scratched or chipped. Luminous, gold or fancy hands, those of improper length or not properly matched (too light or too thin) will not be permitted. A watch that has a photograph or any other obstruction in or on the case, dial or crystal, likewise will not be accepted, nor will snap back or snap bezel cases. A new winding crown must be fitted if the old crown is worn so that full winding of watch is uncertain.

A watch ticks five times every second, 300 times a minute. It is said that the movement of the outer rim of the balance wheel in a year's time is equivalent to the distance from Chicago to Los Angeles and back to Lamar, Colorado—via Santa Fe.

It is well to have a regular time to wind one's watch, preferably upon arising or before going on duty, provided working hours are regular. When a watch is laid on a smooth surface there is a barely perceptible exterior movement over the surface. If the surface is sloping this movement can be rapid and there is danger the watch may fall. It is better to place the watch on a rack with watch in vertical position, stem up, or on a handkerchief or other cloth surface.

To meet conditions imposed by geographical time differentials, an extra hour hand, colored red, may be used on a watch carried by a Santa Fe trainman, engineman or fireman on certain local operating divisions, if they are employed where both Central and Mountain, or Mountain and Pacific standard times are used. The specified divisions are: Western, Colorado (first district), Plains, Pecos, Albuquerque and Arizona.

On the Santa Fe's westward movement, Dodge City and Clovis mark the change from Central Standard to Mountain Standard time; Seligman and Parker, the change from Mountain Standard to Pacific Standard time. On the eastward movement, Seligman and Parker mark the change from Pacific Standard to Mountain Standard time; Clovis and Dodge City, the change from Mountain Standard to Central Standard time.



Safety Department

THE safety department of the Santa Fe, under the jurisdiction of the vice-president in charge of operation, undertakes the very necessary duty of educating all Santa Fe people in matters relating to safety—safety practices, safety mindedness, the prevention by observation of all unsafe conditions and methods which may directly or indirectly contribute to injury or accidents.

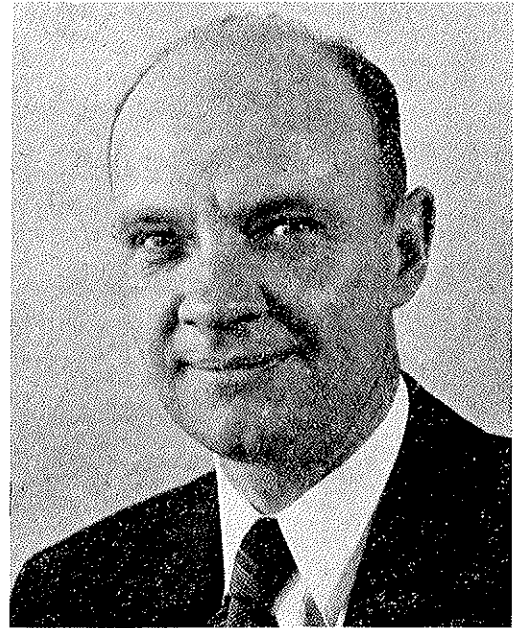
Safety matters are directed by E. L. Duggan, superintendent of safety, Chicago, who is assisted by a system-wide staff consisting of two mechanical department supervisors, who work directly with the system mechanical department personnel; and eight operating department supervisors, who direct safety matters within assigned groups of local operating divisions. All records, including data reportable by the various safety supervisors, are maintained in the Chicago offices.

Rules and regulations in regard to proper and safe methods of performing all tasks on railway premises are clearly established and are so propagated that an awareness of safety confronts not only those engaged in railway occupations, but everyone utilizing railway facilities. Constant observation is under way to the end no unsafe condition may go unnoticed. In this latter goal, the co-operation of all Santa Fe people is solicited.

It remains a basic task to instill in the minds of all the necessity for doing everything the safe and proper way. We do not, at all times, think safely, which means we do not respect the duty involved or reflect on the physical pain and incapacitation, the long years of suffering, perhaps want, which could be the lot of those dependent upon us should we ignore the safe way.

It is a principal task of a railway's safety department to so stimulate its people in regard to safety that an awareness of safety becomes a part of them; that they not only will avoid unsafe practices but will recognize those quick moments when death or injury could strike and deftly and surely will meet those situations. That task demands the interest and co-operation of the entire personnel.

America's railways, in their service to the American people, have an admirable safety record. In the five years 1935-1939,



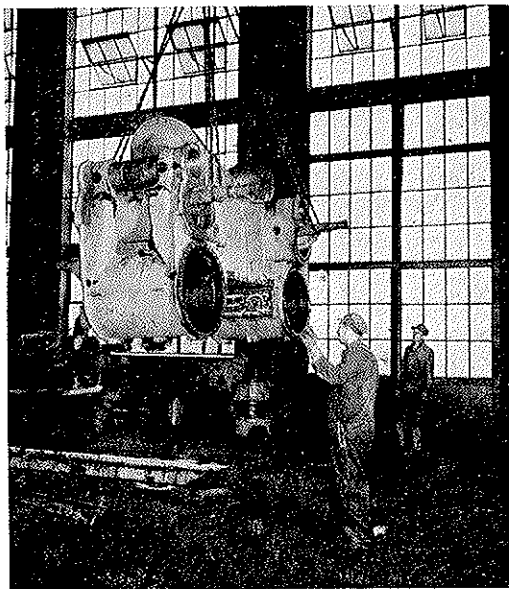
E. L. DUGGAN, superintendent of safety, who directs safety matters on the Santa Fe with the assistance of a system-wide staff.

the total injuries (fatal and non-fatal) to passengers, employees, trespassers and all other persons in all railroad accidents amounted to 9.27 per 100 million traffic units. That was the lowest ever recorded up to that time, but in the five years 1940-1944, covering the war years, this rate of injuries in railroad accidents declined to 6.84 per 100 million traffic units. And the most striking fact of all is that in each year of this five-year period, the rate of injuries in all railroad accidents was less than in the preceding year. That record was not established without diligent effort.

The Santa Fe has a long record of safety achievements since 1912 when its safety department was first organized on a system basis. The safety section of the Association of American Railroads was organized in 1921, recognizing engineering, education, and enforcement as the basic fundamentals of accident prevention. All railway safety programs embody those principles.

Our government regards safety as a vital public necessity; it has instituted laws governing many established railway operating practices and has defined the use

and maintenance of mechanical facilities and appliances adopted by the railways. The immediate objective of a railway's safety program is to eliminate entirely



SAFE PRACTICE. Stand clear when raising or lowering heavy objects. Left to right—L. A. Neill, machinist, and J. E. Plessinger, machinist helper, San Bernardino shops.

those acts of carelessness, thoughtlessness and undue haste, and the more deplorable violations of rules, regulations and instructions which result in accidents that are reportable to the Interstate Commerce Commission. All supervisory forces participate in those efforts. If such accidents can be eliminated, the disappearance of less serious safety faults will follow as a matter of course.

The Interstate Commerce Commission has defined a *reportable accident* as an accident arising from the operation of a railway that results in one or more of the following circumstances:

Damage to railway property amounting to more than \$150, including the expense of clearing wreck, but not damage to or loss of freight or baggage, animals, or property of non-carriers on or adjacent to right of way.

Death of a person.

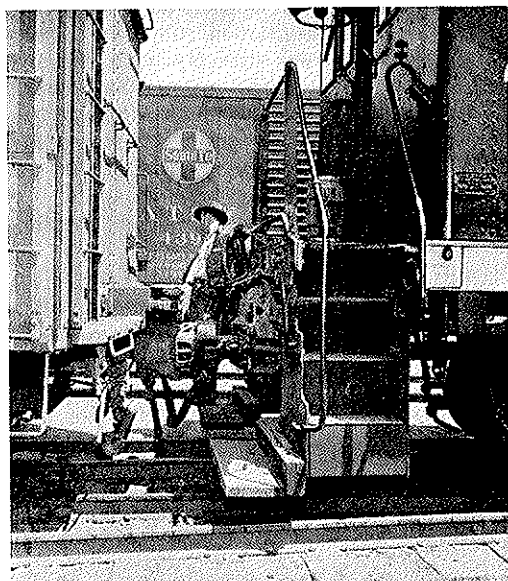
Injury to an employee sufficient to incapacitate him from performing his ordinary duties for more than three days in the aggregate during the ten days immediately following the accident. This rule applies to employees on duty, and to those classed as

not on duty, but does not apply to employees classed as passengers or trespassers.

Injury to a person other than an employee if the injury is sufficient, in the opinion of the reporting officer, to incapacitate the injured person from following his customary vocation or mode of life for a period of more than one day. This rule applies also to employees classed as passengers or trespassers.

Reportable railway accidents are divided into three primary groups: Group 1, train accidents; Group 2, train-service accidents; Group 3, non-train accidents.

Established laws or regulations super-



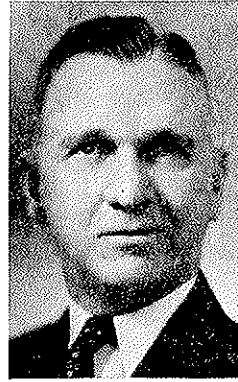
UNSAFE PRACTICE. T. A. Chamberlain, switchman, demonstrates the danger of riding a footboard between engine and boxcar on a curve.

cede the intrusion of almost all factors (except the elements, and mechanical and other failures classed as non-negligent) involved in the first of those three classifications which includes: collisions, derailments, locomotive-boiler accidents and other locomotive accidents or failures not resulting in a collision, derailment or boiler accidents, and miscellaneous train accidents.

In addition to laws, long established railway operating and mechanical rules govern such operations, as well as those of the second group. The latter group, train-service accidents, includes: accidents to employees while engaged in coupling or uncoupling locomotives or cars; accidents to employees while engaged in coupling or uncoupling

air hose (or turning angle cocks in connection therewith), steam hose and safety chains; accidents to employees while operating locomotives, while operating hand brakes, and while operating switches; accidents to persons on moving cars or locomotives resulting from coming in contact with any structure or fixture above or at side of track; accidents to persons while getting on or off cars or locomotives; accidents at highway grade crossings; struck or run over by cars or locomotives not classifiable as highway grade crossings; miscellaneous train-service accidents not elsewhere classifiable. There is hardly a factor in all those accidents which is not covered by a rule, a regulation or a law.

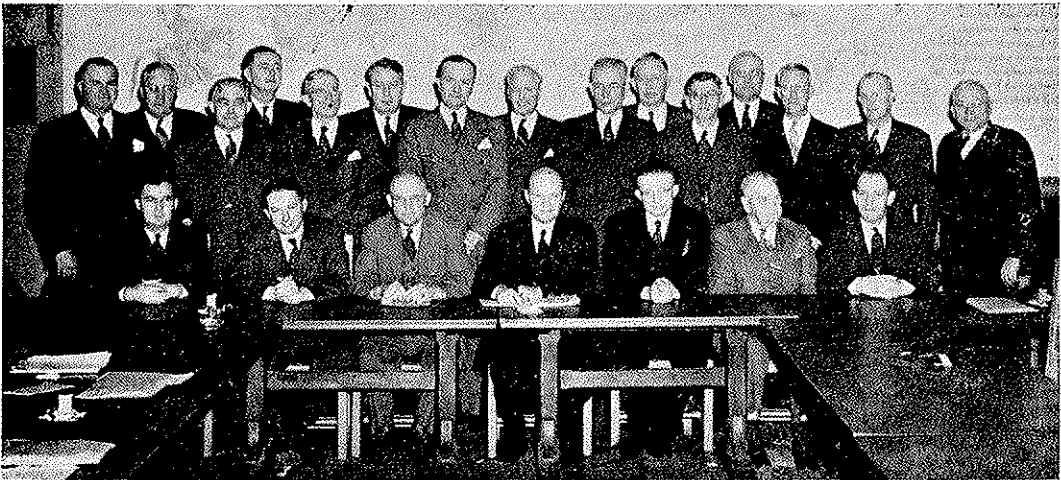
The third group of reportable railway accidents, non-train accidents, include those accidents to employees that do not occur directly in connection with the operation or movement of trains, locomotives or cars; i.e., accidents occurring in connection with the construction, repair or painting of buildings, tracks or other structures or equipment (except running repairs made by trainmen on the road); with the movement, by shop, enginehouse, or other industrial employees, of locomotives or cars in shops, enginehouses or repair tracks, and so forth, when in connection with in-



S. S. ALLISON, who was appointed safety supervisor of the Los Angeles Division, with headquarters at San Bernardino, Cal., to succeed L. H. Collett, pictured in group below, who retired on February 1, 1946, after more than 50 years of faithful, conscientious service.

dustrial works; or the loading or unloading of cars at station or freight-house platforms, on yard tracks, or elsewhere; and accidents to all classes of persons while on right of way or other railway premises, that do not occur directly in connection with the operation or movement of trains, locomotives, or cars, with certain exceptions.

It is in the second and third groups, where the human equation has more latitude, that absent-mindedness, carelessness and the mania for short-cutting can, despite supervision, get in their deadly work.



ANNUAL MEETINGS of all Santa Fe system departments and their executive heads are held in the interest of safety. The group pictured above attended a two-day session held in Albuquerque to study ways and means of curbing accidents on the railroad. Left to right, front row—L. R. Villermin, Paul K. Sharpe, S. G. Sebrell, safety supervisors; E. L. Duggan, safety superintendent; A. N. Baker, L. H. Collett and S. C. Flagler (deceased), safety supervisors. Standing—O. G. Pierson, mechanical superintendent, Gulf Lines; W. P. Hartman, mechanical superintendent, Coast Lines; J. W. Atkinson, mechanical superintendent, Eastern District; F. A. Baker, assistant general manager, Coast Lines; J. P. Cowley, assistant general manager, Gulf Lines; E. P. Dudley, assistant general manager, Southern District; C. R. Tucker, acting general manager, Coast Lines; O. L. Gray, assistant to vice-president; P. O'Sullivan, assistant general manager, Eastern Lines; W. D. Hartley, mechanical superintendent, Western District; C. S. Cravens, assistant general manager, Eastern Lines; P. J. Danneberg, mechanical superintendent, Southern District; G. R. Buchanan, assistant general manager, Western Lines; W. R. Harrison, mechanical superintendent, P. & S. F. Ry., and G. R. Miller, superintendent shops, Albuquerque.



MECHANICAL DEPARTMENT Safety committee at meeting in Los Angeles. Left to right—M. S. Paul Baca, Mary Ramirez, J. R. Decker (safety supervisor), R. V. Ketring, W. E. Brown, F. R. Baysinger, J. F. Anderson, W. J. Corliss. There are 96 safety committees on the Santa Fe system, 29 of which are in the mechanical department.

A TYPICAL safety meeting of operating department employees. These meetings are made as educational and entertaining as possible. Discussion is encouraged among the attendants, and every effort is made to make each meeting a social as well as an educational event.



There are ninety-five safety committees on the Santa Fe system, twenty-nine of which are in the Santa Fe's mechanical department. Safety committees are composed of Santa Fe personnel, including supervisory officers, all of whom assist the safety supervisors assigned to the respective territories. Committeemen are appointed by the superintendent or master mechanic in conjunction with the safety supervisors and are very helpful in progressing safety work. They are, in effect, disciples of safety among all Santa Fe personnel. Santa Fe people often submit suggestions on system safety procedures to their supervisors or to the superintendent of safety. Such interest in the welfare of others is highly commendable.

Each safety supervisor is required to schedule and hold safety meetings within his assigned territory to secure the active

interest of Santa Fe people toward reducing injuries by correcting unsafe habits or conditions that may prove hazardous. Supervisors investigate accidents in an effort to determine the cause, and they work with departmental supervisory forces to improve the safety performance on their territory. They must see that safety literature, posters and bulletins are properly displayed on bulletin boards and choose locations where boards will be observed by the greatest number in a further effort to stimulate interest in safety endeavors. Supervisors also make frequent visits to hospitals, taking an active interest in Santa Fe people confined there.

Where there is regional or local evidence of an unsatisfactory safety performance, the supervisors hold impromptu safety meetings. They check shops and yards and other facilities, note any unsafe conditions

or practices and handle with operating division and mechanical supervisory forces for correction. Their duties are that of an observer and tutor, correcting any unsafe working habits by portraying to those at fault the proper way to do a particular job.

An award, in the form of a plaque, is bestowed upon each operating division, large shop, and master mechanic's district, for the best safety performance among those facilities throughout the Santa Fe system lines. The award is predicated on a man-hour to injury basis. In addition, a card or citation is presented to each Santa Fe person working in the particular division or facility which wins the safety trophy.

At intervals, throughout the Santa Fe system, safety drives, such as a campaign dealing with "no accidents" in a particular month, or special drives on a particular territory where safety impetus is needed, are arranged by the superintendent of safety and carried through by the supervisors and committeemen. Because safety is educational in scope, it is necessary constantly to keep safety before the entire system personnel. Much of the work in that regard is of a creative nature—devising

ways and means of bringing forcibly to the attention of all Santa Fe people the need for working in a safe manner, to safeguard the welfare of themselves, their families, and all others.

Four monthly statements on injury statistics are prepared and distributed monthly by the superintendent of safety over the Santa Fe System lines. These are:

A comparative statement showing by operating divisions the number of casualties to employees on duty (fatal and non-fatal) as reported to the Interstate Commerce Commission during a given month in the current year compared with the same month in the previous year.

A comparative statement showing the number of casualties in the mechanical department to employees on duty (fatal and non-fatal) as reported to the Interstate Commerce Commission. This statement shows statistics by months and cumulative for the year covering divisions and shops.

A comparative statement showing the number of casualties in the mechanical department by mechanical superintendents' districts to employees on duty (fatal and non-fatal) as reported to the Interstate Commerce Commission. This statement indicates statistics by months and is cumulative for the year.

A comparative statement based on man-hours per casualty to employees on duty (fatal



TWO OF THE MANY safety posters that originate in the safety department. It is a policy to make such posters and other printed media attractive and intriguing.

and non-fatal) as reported to the Interstate Commerce Commission. This statement indicates casualties by divisions, large shops, system departments and employee groups and appears monthly in *The Santa Fe Magazine* as well as the Santa Fe Safety Facts pamphlet distributed over the system, accompanied by an article on safety.

Two statements are submitted monthly to the Association of American Railroads, one concerning employee casualties, and the other grade crossing accidents. That material is used by the A. A. R. for comparison and compilation purposes.

All safety poster ideas originate in the safety department and are submitted to the Santa Fe's advertising department for completion. It is a policy to make such posters and other printed media attractive and intriguing. Likewise, all safety meetings are made as educational and entertaining as possible. Attractive and interesting motion pictures are shown including the various popular films prepared by the Santa Fe and others of a safety theme. Such films are always well received. Discussion is stimulated between those attending the meetings and effort is made to make each meeting a social as well as an educational event.

There are also annual meetings of all Santa Fe system departments and their executive heads in the interest of safety. Held at Albuquerque or some centrally located system point, these meetings stress

the importance of safety, and in the various discussions many system problems are solved and plans and policies adopted.

Reports of all injuries and accidents occurring on the Santa Fe system are received by the superintendent of safety. Those reports are indexed and records maintained of accident frequency. Inquiries are made by the superintendent of safety of such supervision as may be most directly concerned with unsafe practices, rule violations and unsafe conditions developed in accident investigations. Through this medium corrective action is taken.

The safe way not only is the best but it is the shortest way. Quoting our superintendent of safety: "In the average railway yard, shop, roundhouse or office, it sometimes is felt that speed is of the first importance; that locomotives and trains must be made ready; that the performance of those engaged in that work is incidental to the accomplishment of the job at hand. That is not true. Safety, it must be remembered, is of first importance in the discharge of one's duties. There are no shortcuts where safety is concerned. When you hear your fellow worker say he hasn't time to do it the safe way, take him by the arm and tell him he is wrong. All of us must realize how essential it is that we work with safety foremost in our minds at all times. Then, and then only, can we hope to avert the toll of needless injuries and deaths."

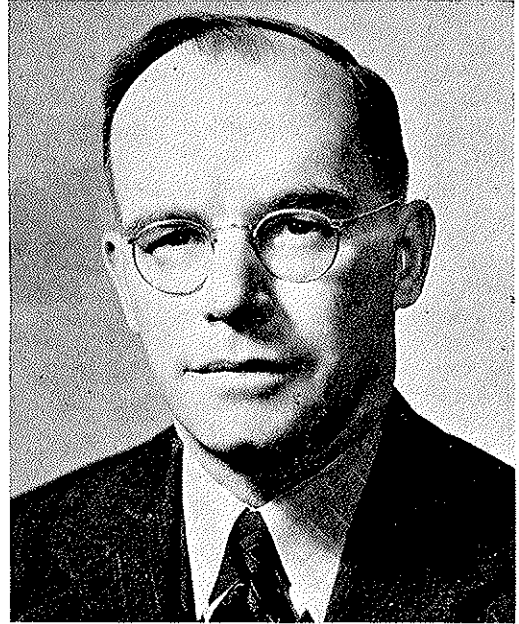


Personnel Department

WITHIN a far-flung railway system such as the Santa Fe, with its thousands of personnel and numerous supervisors scattered throughout twelve states and over more than 13,000 miles of railway, it is necessary that the bases upon which the personnel shall be remunerated for their services be stipulated in considerable detail.

That procedure usually is accomplished through the medium of agreements between the Santa Fe and the organizations which have been duly authorized by the various classes of employees to represent them in their relations with the company. There are thirty-two such agreements now in effect between the Santa Fe and twenty different organizations representing various classes of employees. The agreements, known as "agreements covering wages and working conditions", have a very important bearing upon the Santa Fe's operating methods and upon the day to day routine of its personnel. The agreements are printed in booklet form and a copy is given each Santa Fe man or woman whose services are governed thereby.

Many of the rules in the agreements had their origin in the various wage orders issued by the U. S. Railroad Administration during World War I; it was necessary, however, in many instances, to supplement those wage orders by negotiating rules to cover conditions peculiar to the individual railways. It is also necessary to negotiate revisions to the rules from time to time,

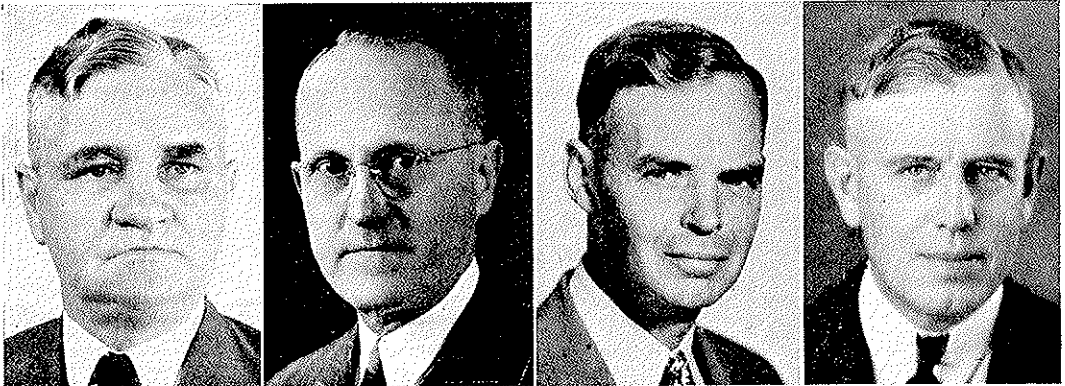


SAMUEL C. KIRKPATRICK, assistant to vice-president, operation, who is in charge of the personnel department, with headquarters in Chicago.

and to continually supervise their application to specific circumstances.

That complex task requires on both sides of the discussion-table, the full-time attention of men of experience and with a mutual understanding of the problems of each other.

The details of those negotiations are



ASSISTING IN THE NEGOTIATION, interpretation and application of agreements covering wages and working conditions on the Santa Fe are, left to right, J. E. Dyer, Amarillo; A. L. Soule, Topeka; H. H. Tisdale, Los Angeles, and H. M. Lawler, Galveston, each with the title of assistant to general manager.

handled for the Santa Fe by S. C. Kirkpatrick, assistant to vice-president in charge of operation, located at Chicago. Mr. Kirkpatrick is assisted by four officers located on the Santa Fe's grand operating divisions. Those officers are:

J. E. Dyer, assistant to general manager, Amarillo.

A. L. Soule, assistant to general manager, Topeka.

H. H. Tisdale, assistant to general manager, Los Angeles.

H. M. Lawler, assistant to general manager, Galveston.

The primary duties of those officers is to assist in the negotiation, interpretation and application of agreements covering wages and working conditions, and, when disagreements arise, to obtain the facts, meet the representatives of the affected employees, and attempt to find a mutually satisfactory disposition thereof.

The interest of the employees in these negotiations are protected by representatives of their own choosing. While the details vary to some extent with each class of employees, the general practice is to choose a local chairman for each seniority district; the latter also serving as a member of a general committee or general grievance committee, which is headed by a general chairman. The general committee, with the general chairman as spokesman, usually participates in conferences with the Santa Fe's officers for revisions of agreements; otherwise, the local chairmen function individually in handling with local Santa Fe officers grievances arising on their respec-

tive seniority districts. If the local chairmen are unable to satisfactorily dispose of such grievances, they may be referred to the general chairman for handling on appeal.

It is, of course, impossible to insert in the agreements specific rules to cover all of the innumerable situations which can and do arise in the operation of our railway; consequently, there are numerous opportunities for dispute and misunderstandings as to the application of the agreements to specific circumstances. When these disputes and misunderstandings arise, the usual procedure is for the affected employee to present a claim to his immediate supervisor or to the head of his department on the seniority district. If the claim is not allowed, the matter is usually referred to the local or general chairman for further handling by the various officers of the Santa Fe designated to consider appeals.

In some instances, the prescribed procedure is to appeal to the assistant general manager or general manager of a grand operating division, whose decision is final; in others, appeal may be taken beyond the general manager to the assistant to vice-president.

Appeals to the general managers and beyond usually are handled by the general chairman. If the general chairman and the final officer of appeal for the Santa Fe are unable to reach a mutually satisfactory disposition of the matter, it may then be submitted to the appropriate adjustment board established under the provisions of the Railway Labor Act, as amended.

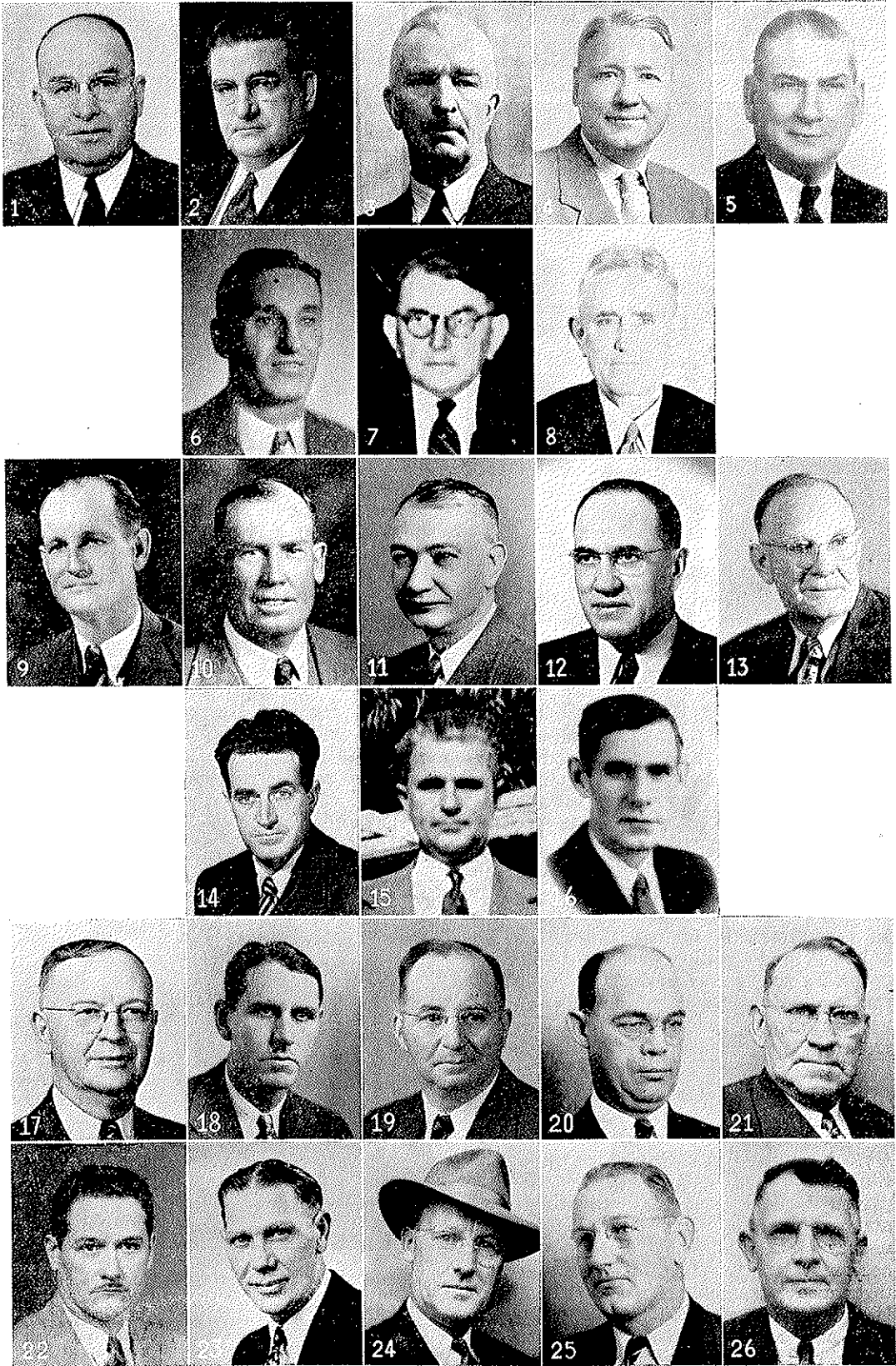
GENERAL CHAIRMEN who represent the various classes of employees throughout the Santa Fe system:

Eastern and Western Lines: 1—H. R. Taylor, Order of Railway Conductors, Amarillo. 2—H. W. Gross, Brotherhood of Railroad Trainmen, Kansas City. 3—J. A. Kowalski, Brotherhood of Locomotive Engineers, Emporia. 4—H. I. Stephens, Brotherhood of Locomotive Firemen & Engineman, Topeka.

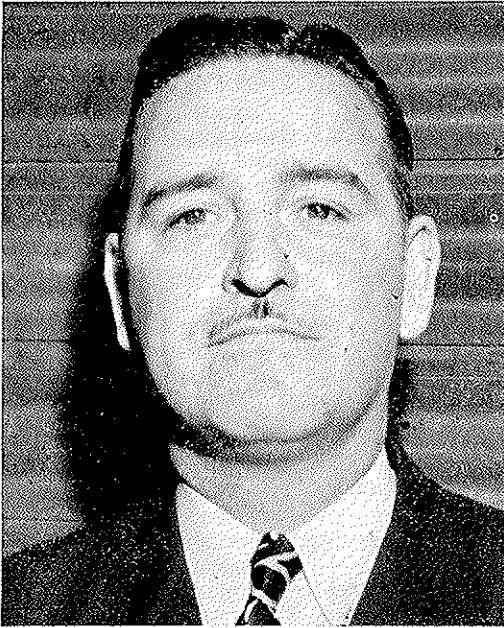
Coast Lines: 5—A. Young, Order of Railway Conductors, Los Angeles. 6—C. C. Chapman, Brotherhood of Railroad Trainmen, Los Angeles. 7—V. L. Whitlow, Brotherhood of Locomotive Engineers, Los Angeles. 8—K. B. Walton, Brotherhood of Locomotive Firemen & Enginemen, Los Angeles.

Gulf Lines: 9—Virgil P. Chance, Order of Railway Conductors, Silsbee. 10—R. E. Powell, Brotherhood of Railroad Trainmen, Temple. 11—R. W. Harris, Brotherhood of Locomotive Engineers, Brownwood. 12—A. S. Reed, Brotherhood of Locomotive Firemen & Enginemen, Gainesville.

13—J. W. Chandler, Railroad Yardmasters of America, Cleburne, Tex. 14—Eugene O. Crum, American Train Dispatchers Association, San Bernardino, Cal. 15—J. C. Reber, National Council Railway Patrolmen's Union, A. F. L., San Bernardino. 16—John Byrne, Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees, Chicago. 17—J. F. Anderson, The Order of Railroad Telegraphers, Topeka, Kan. 18—W. H. Lewis, Brotherhood of Railroad Signalmen of America, St. John, Kan. 19—R. K. Corkhill, The Association of Maintenance of Way and Miscellaneous Employees, Inc., Topeka, Kan. 20—B. O. Bristow, International Association of Machinists, Albuquerque, N. M. 21—T. H. Ryan, International Brotherhood of Boilermakers, Iron Ship Builders and Helpers, Arkansas City, Kan. 22—A. B. Ausherman, International Brotherhood of Blacksmiths, Drop Forgers and Helpers, Topeka, Kan. 23—L. C. Dunmeyer, Sheet Metal Workers International Association, Los Angeles. 24—W. R. Leonard, International Brotherhood of Electrical Workers, San Bernardino, Cal. 25—Virgil E. Tyson, Brotherhood of Railway Carmen, Pueblo, Colo. 26—Guy Cogswell, International Brotherhood of Firemen and Oilers, Roundhouse and Railway Shop Laborers, Fort Madison, Iowa.



Department of Employment



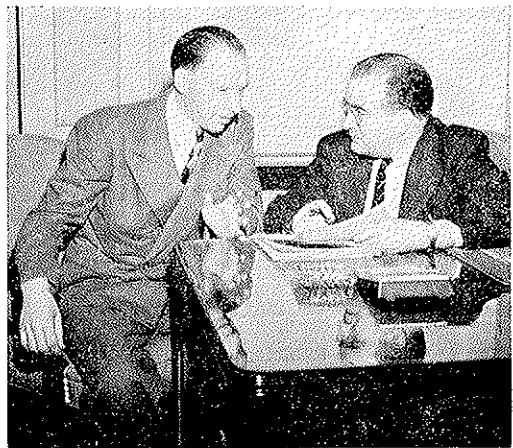
L. D. COMER, director of employment, with headquarters in Chicago.

THE Santa Fe's department of employment, with L. D. Comer, director of employment, Chicago, is under the jurisdiction of the vice-president in charge of operation.

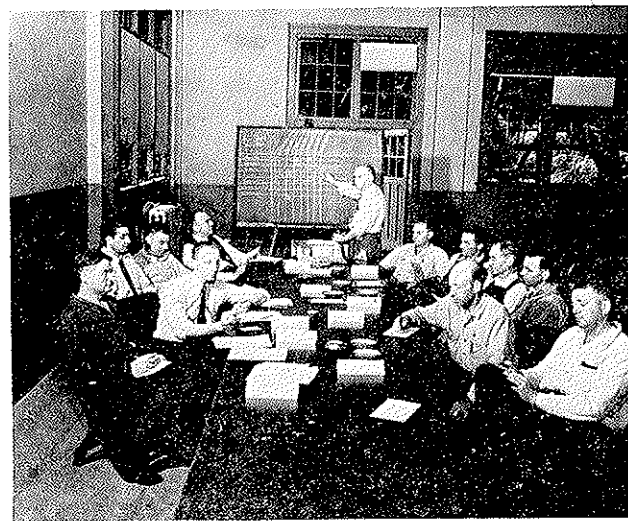
The department of employment has a responsibility to all Santa Fe departments. During war emergency periods, its major efforts were directed toward relieving the manpower shortage occasioned by the war. In peacetimes, it fosters a practical employment and training program to the end Santa Fe people may advantageously utilize the knowledge they have gained, and that new employees, selected on the basis of training and experience, may be placed in those branches of Santa Fe service where such training and experience will be of mutual benefit.

During World War II, the department of employment was in contact with the United States Railroad Retirement Board's employment department, co-operating with and endeavoring to secure from that agency all possible assistance in supplying necessary workers for the Santa Fe. Contacts also were maintained with the War Manpower Commission, in the interpretation and application of regulations designed by the Commission to stabilize labor.

Through those two agencies, and with the aid of field forces working in the enlistment and transportation program, thousands of Mexican Nationals were brought into this country for work on the Santa Fe. The program began in June, 1943, and many details and problems in relation to the entry of those Mexican citizens, of whom at times 12,000 were employed in various capacities in the maintenance of way, mechanical, ice, and stores departments, had to be disposed of to the mutual satisfaction of both governments. Each Mexican National contracted to work for the Santa Fe for a period of six months after which he had the privilege of renewing his contract. He was privileged to return to Mexico at anytime he desired. Arrangements for transportation, meals and housing, from arrival until departure, his care, supervision and general welfare while in this country, had to be carefully outlined and followed to conclusion. Each Mexican National was given a ration book, assisted in securing necessary clothing and other supplies. At each point on the Santa Fe's lines, his meals and lodging had to be ready for him. He received all benefits of the various Santa Fe hospital associations, was privileged to transfer from one branch of service to another, and, when he returned to Mexico, was carefully routed to the border.



CLOSE CO-OPERATION existed between the Santa Fe and the Mexican consulates in this country regarding the employment and care of Mexican Nationals. Here we see H. A. Greene, labor replacement supervisor, conferring with Manuel Aquilar, Mexican consul general, at Los Angeles.



COURSES IN MODERN industrial training techniques have been set up by the director of employment. Here, F. J. Repman is shown in charge of Santa Fe's supervisors' training session at San Bernardino.

Close co-operation existed between the Santa Fe and the Mexican consulates in this nation in regard to the Mexican Nationals, the Santa Fe sharing with those representatives of the Mexican government the many problems which arose.

Courses in modern industrial training techniques are being set up by the director of employment. Such courses do not seek to teach Santa Fe people how to do their jobs. They seek to provide for them the most modern methods of supervision. The techniques apply to all types of supervision in all Santa Fe departments. Emphasis is placed upon the value of positive psychology. The plan, instituted with the aid of War Manpower Commission training specialists, is to train a number of Santa Fe people who will serve as instructors as the program progresses. Because every Santa Fe man and woman contacting the public is a salesman, training programs will be developed to make Santa Fe people better salesmen.

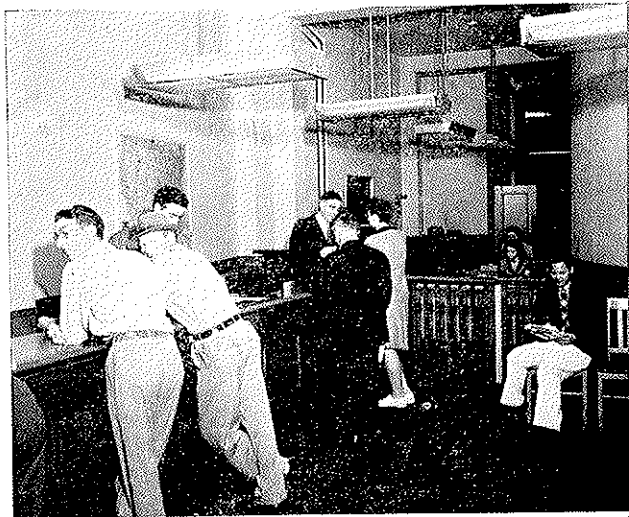
In those aspects and others, the department will work closely with the public relations department, it being recognized that employee relationships are of basic importance in the building of good will within as well as without an organization. A satisfied customer is prone to return where he has pleasant surroundings and where he is well treated.

The development of improved employment methods, standards for selection, with

aptitude tests for new workers, in addition to stimulating the recruitment of new workers, comprise a portion of the employment department's program. Employment in the various cities where there is a considerable number of Santa Fe employees has been concentrated under the supervision of responsible officials. At many locations special offices have been opened for that purpose.

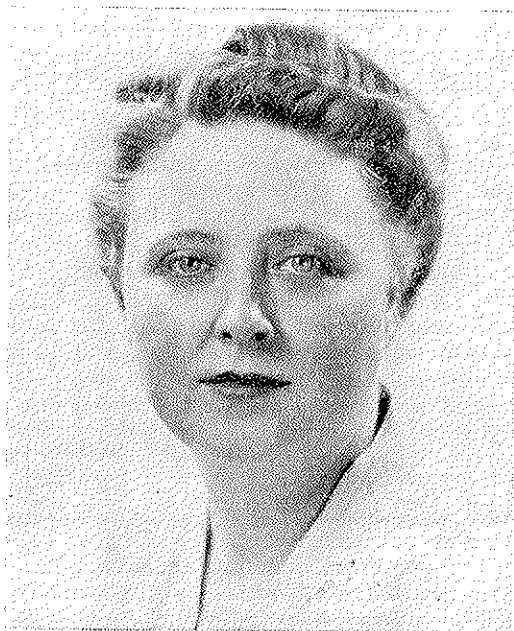
There are no schools of railroading, as such, except the railroads themselves. One may study traffic rules, regulations and procedures, as well as the many Federal and state laws and rulings governing railway management and operation, and it is profitable to do so; but there remains the task of acquiring a first-hand knowledge of the countless details which merge into the composite railway operating picture. In addition to methods and rules, the railway's job usually involves factors of time, location and expediency. The lack or failure of one often discounts the need for or presence of the others.

The railway was and remains an institution that one matures with. The department of employment, by systematic direction of adopted methods, endeavors to guide Santa Fe people in the course of that maturity. It means getting more out of one's efforts with greater enjoyment in one's tasks. It develops to the fullest those factors which enhance the relationship between Santa Fe men and women and the the officers and executives who guide the Santa Fe's policies and developments.



EMPLOYMENT METHODS have been concentrated under the supervision of responsible officials. Here is a typical view of a Santa Fe employment office.

Women Personnel



MARGARET L. IRWIN, special representative of the vice-president, operation, who is in charge of women personnel.

THE Santa Fe's women personnel department was established in 1943 under the direction of Margaret L. Irwin, special representative to the vice-president in charge of operation. Miss Irwin is assisted in the system-wide functions of the department by the following grand division officers:

Katherine M. Gilleece, special representative, Topeka.

Hannah Sue Hathorn, special representative, Amarillo.

Eleanor J. Ford, special representative, Los Angeles.

Wilma J. Marsden, special representative, Galveston.

The Santa Fe has many accomplished women in its service. Those women, some of whom have been in the Santa Fe's service for many years, take an active part in civic affairs. They are members of traffic and commercial clubs, often serving those organizations in executive capacities.

Women have always been identified with the Santa Fe. In early days, with their husbands, they braved the newly opened Southwest, living above depots and in such other housing facilities as could be established in a country that had little or no population and did not offer any of the advantages, from a social viewpoint, to be found in the Middlewest and East. Many widows of Santa Fe men remained at lonely stations, serving as agents and operators and in clerical capacities. Nor must we forget the wives of Santa Fe men who year after year maintain the dependable, good homes which are essential to the well-being of Santa Fe men.

When World War II engulfed the United States, there were quite a number of women performing various duties on the Santa Fe which previously had been done only by men. The call for volunteers to the armed services and the advent of selective service some months before, had begun the depletion of Santa Fe male personnel which, with Pearl Harbor and subsequent declarations of war, resulted in a growing manpower shortage.

Many Santa Fe traditions were abolished as war activities grew in scope and more

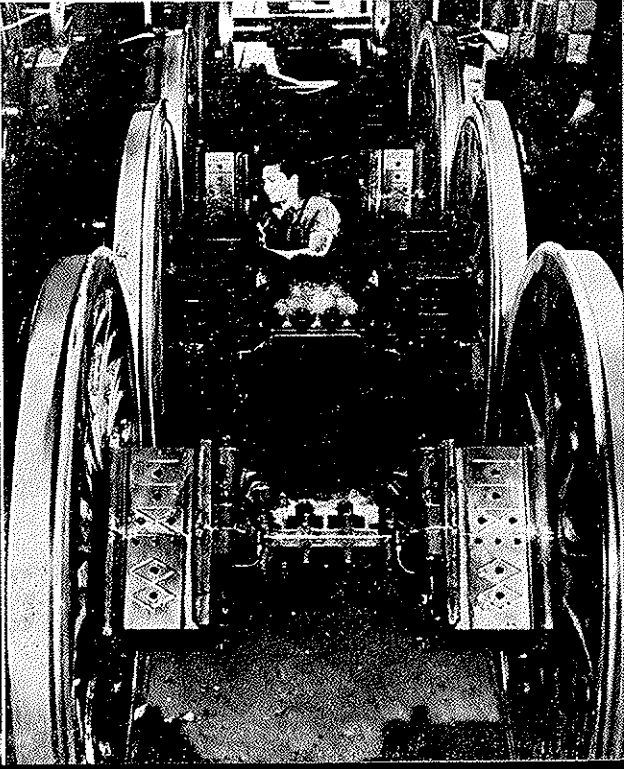
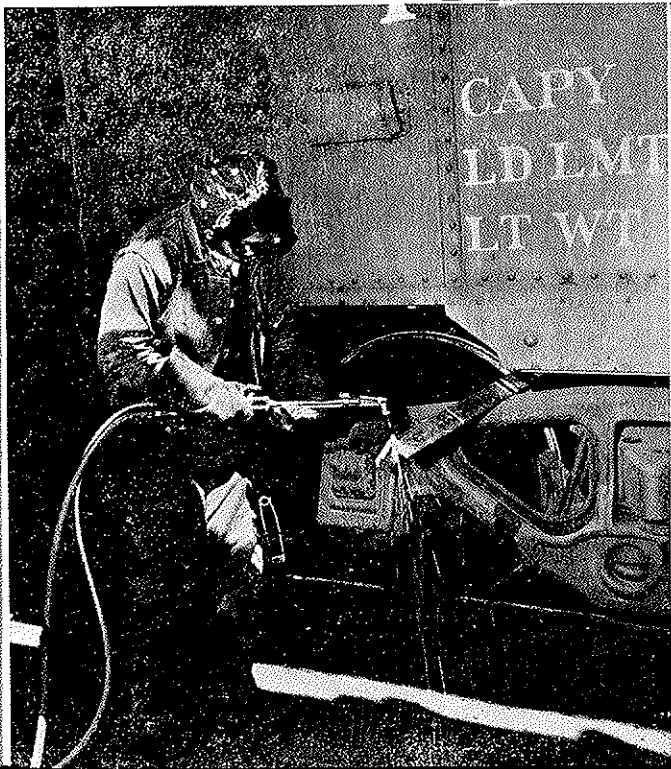
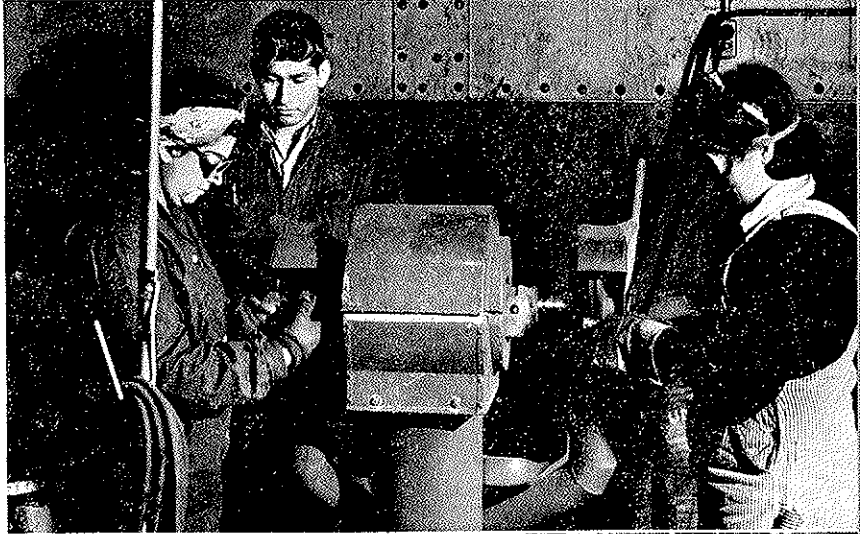


SPECIAL REPRESENTATIVES of the women personnel department. Left to right—Katherine M. Gilleece, Topeka; Hannah Sue Hathorn, Amarillo; Eleanor J. Ford, Los Angeles, and Wilma J. Marsden, Galveston.



SANTA FE WOMEN AT WORK

Many Santa Fe traditions were abolished as war activities grew in scope and more and more women were attracted to Santa Fe service. Upper left—Cleaning all parts of the interior of a stainless steel coach, and applying special head and arm covers on this equipment. Upper right—Juanita Martinez Hernandez cleaning roller bearings in locomotive shop. Center—Cleaning second-hand bolts for reissue at the shop; left to right, E. R. Cabrera, Rudolph Espino and Natalia R. Moyeda. Lower left—it takes a very good burner to be able to cut an angle iron without a brace for the hands, but Miss Socono Lechuga is just that kind of a workwoman. Lower right—Carmen Honesto cleaning the driver wheels of a Santa Fe passenger engine.

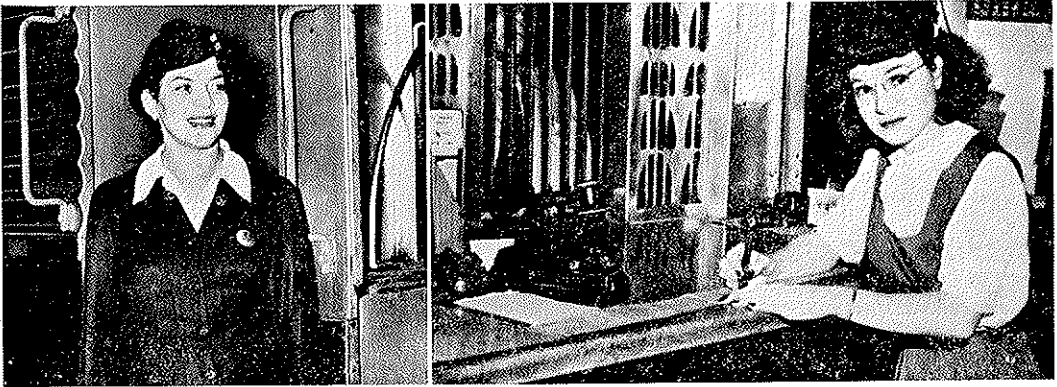


and more women were attracted to Santa Fe service. They occupied a number of unusual positions, performing their duties in a satisfactory manner.

It was found necessary to place many of the new feminine employees at locations where there either were no accommodations for their presence or existing accommodations were inadequate. Immediate problems of providing protective escort for women personnel on late shifts, supplying rest, locker and lunch room facilities, arranging transportation and housing in metropolitan areas and installing living quarters and various necessities at outlying stations confronted the management. There are special laws governing the employment and service of women, differing in various states, usually having to do

ever been before. Santa Fe women appeared on depot platforms, servicing trains and assisting passengers. They wielded blacksmith's hammers, forged blank engine bolts, helper electricians, steam fitters, upholsterers and many other Santa Fe craftsmen.

To meet the problems confronting it, and to safeguard the future of feminine employment on the Santa Fe, the management created the women's personnel department, delegating to Miss Irwin and her assistants the many details which had to be investigated, appraised and acted upon. There were the initial problems of working with Santa Fe officers in preparing adequate facilities for the welfare of newly acquired women workers, and introducing the latter to positions and environments which were



SELLING TICKETS is but one of the many duties assigned to Robin Juanel Burge (right), information clerk in the depot ticket office at Galveston. At left is Hortense Jerrine Patrick, chair car attendant. A graduate of Lincoln High School, Kansas City, she later attended college at Wilberforce, O., for two years. Her service with the Santa Fe dates from March 2, 1944.

with length of working hours, segregation, and other necessary measures.

The Santa Fe was desirous of attracting intelligent and willing women workers to its ranks, knowing that the caliber of its feminine personnel would encourage or discourage those women desiring employment with the Santa Fe at future dates. Women appeared on Santa Fe trains as chair-car attendants, requiring uniforms and accommodations at both ends of their run; as operators in signal towers; as agents, freight handlers, turntable operators, yard clerks, track sweepers, drill press operators, sheet metal workers; as engine wipers, machinist helpers, fire builders, cab cleaners, lubricator fillers, timekeepers, and in many other positions. While the women that relieved Santa Fe men in clerical capacities comprised a large number, the ratio of those undertaking exclusive man tasks was considerably higher than it had

new to them. In commendable fashion, Santa Fe women have assimilated the needs for safety, precision and dependability peculiar to most railway practices.

It was the Santa Fe's objective to place women in all positions for which they could qualify. Many wives, daughters and sisters of Santa Fe men volunteered to assist in the emergency. There were some cases of entire families laboring at the same Santa Fe location, and one instance of six sisters handling freight at a large Santa Fe terminal. Santa Fe women work shoulder to shoulder with the men, receiving no favoritism from co-workers or supervisors.

It is a particular function of the women's personnel department to attract feminine workers to the Santa Fe, to interview them and to place them where they will be satisfied and will accomplish the most good. In that respect the department acts as a clearing house for other Santa Fe departments,



TEA TIME provided for telephone and telegraph department women personnel in the general office building at Los Angeles. Left to right—Elsie Nash, Fannie Sabin, Eleanor Ford, special representative; Lorraine Gulick and Betty Carlson.

recruiting, interviewing and placing women workers. The members of the department endeavor to meet, personally, all Santa Fe women, studying the conditions which surround each group, discussing mutual problems and advocating and instituting remedies where needed. Santa Fe women are encouraged to wear proper clothing and to venture only into proper places—a basic safety measure. Frequent talks on absenteeism, War Bond purchases, and a general outline of the tasks confronting the Santa Fe, are given.

The department had to meet some community problems in those small on-line

Santa Fe cities which, because of the war emergency, were confronted with a sudden population increase. As the bulk of the population was Santa Fe people, their well-being was a matter of concern to the Santa Fe. The department instituted playgrounds and part-time care for children, formed social groups, outlined and assisted with various entertainment programs. Housing conditions were investigated. At larger points, the department arranged for and escorted groups of Santa Fe girls to dances at outlying military camps and assisted Santa Fe women participating in War Bond and other patriotic drives.



MISS HATHORN visits with girls in master mechanic's office at Clovis, N. M., during the lunch period.

Contract Department

IN ADDITION to its primary responsibility of moving traffic and maintaining the company's property, the operating department handles many other problems. Among these are arrangements with other railroads made in the interest of economy and in saving capital investment for the joint use of sections of railroad, station facilities, terminals, industrial developments, and the like, and in a number of instances for the construction and ownership jointly with other railroads of union depots, terminals, and short line railroads; also relationships with other railroads involving crossings and interlocking plants or other forms of protection.

In conjunction with the traffic department, the operating department deals with industries in the leasing or sale of property and the construction of service tracks. It handles matters pertaining to the acquisition of land and other property. It has numerous relationships with Federal, state, municipal and other public authorities with respect to highways, streets, and other matters. It deals with public utility companies on power, telephone, and pipe lines that cross or extend along the right of way; with oil companies in oil drilling developments embracing railroad property; with power and gas companies for the purchase of electricity or gas for the operation of shops and other facilities, and has numerous other functions of a miscellaneous nature.

Much of the detailed work of negotiating and reducing these matters to contract or lease form originates with and is handled by the general managers, who have well established departments in their offices that specialize in this field. Contracts and leases covering transactions that can be terminated within a year, and do not require an expenditure above a certain amount of company money, may be prepared and signed by general managers, but everything in excess of those limits is submitted to the vice-president of operation. All such matters are assigned to the contract department headed by W. C. Hilton, assistant to vice-president.

In addition to analyzing contracts, leases and other matters submitted by general managers and passing them on for executive attention, the contract department directly handles many of the important



W. C. HILTON, assistant to the vice-president, operation, who directs the functions of the lease and contract department.

transactions with other railroads and with outside concerns, and drafts the contracts and other instruments required in closing them out. It also advises general managers on the disposition of the many problems that constantly arise in the administration of contract and lease matters, particularly those relating to union depot and terminal companies.

The contract department also handles directly many matters that arise in the Chicago area. It handles the Chicago Elevator and directs the Chicago Produce Terminal through which the greater part of the fruits and vegetables for Chicago, and for reconignment to other destinations, is handled. It looks after matters arising under the Fred Harvey, Pullman, Western Union, and Railway Express Agency contracts, and others of a general nature. It has charge of the preparation of a large number of printed forms of contracts, leases, licenses, deeds, and the like, and issues the instructions pertaining to their use.

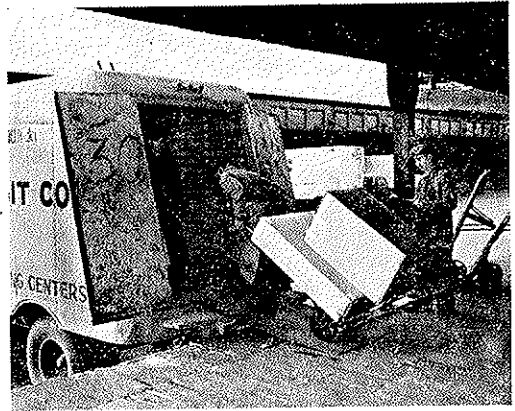
Printed standard forms of leases, licenses, agreements and other contractual arrangements are approved by the Santa

Fe's law department, and a large number are finally approved by the president, before being printed and distributed throughout the system lines. This procedure is in the interest of accuracy, completeness, and uniformity throughout the system in the handling of the different classes of contractual instruments. Printed forms are revised from time to time in the light of experience gained and to meet changing conditions. In the event changes in the printed language are required to make the printed forms fit an unusual situation, the instrument, prior to execution, must again be submitted for legal and executive approval.

Not a small part of the contract department's duties pertains to the sale and other disposition of real estate from the actual negotiation of sales to the drafting and other handling of the conveyance papers, including applications for releases from mortgage liens.

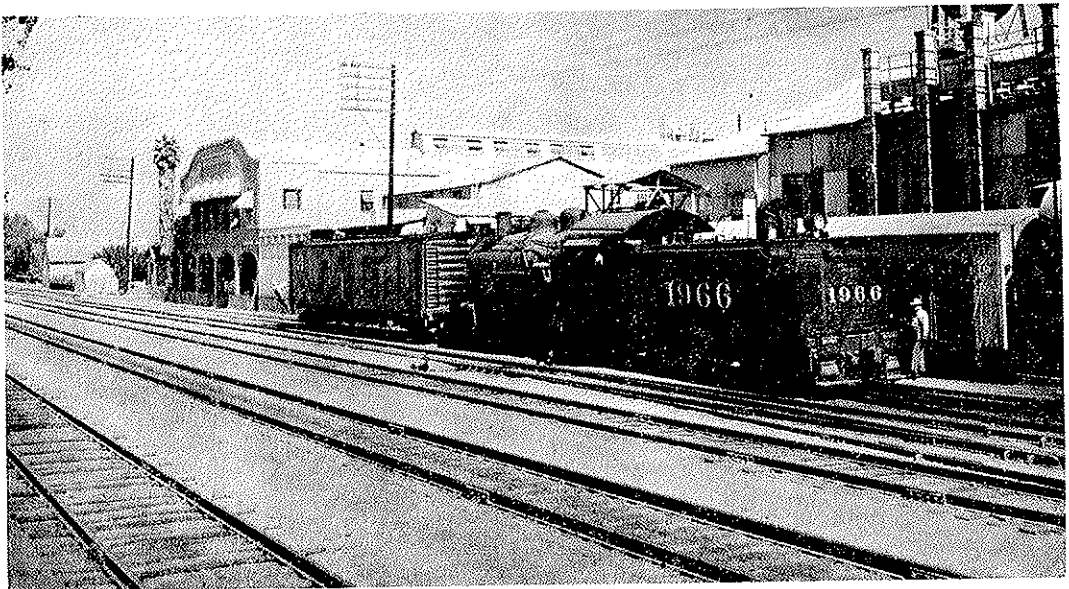
The administration of certain trust properties, at Chicago and elsewhere, and the handling of documents and problems in connection therewith is also part of the work of the contract department.

A number of Santa Fe departments have a part in the negotiation and completion of a finished contract. In the case of industry track contracts and other contracts based thereon, for example, the first procedure generally is for the industrial section of the traffic department to discuss with an



A CONTRACT DRAYMAN picking up l. c. l. freight at Santa Fe freight house for delivery to private industry — door-to-door delivery. Other contracts cover the transfer of interline l. c. l. freight between the Santa Fe and other railways at terminals or junctions, and the performance of various services for the Santa Fe.

established or proposed industry track or track extension service to its plant. In the case of a new or additional track, when a satisfactory location for the track is agreed upon, the engineering department prepares a plan and an estimate of cost of construction. This plan is recorded on a print which is attached to and made a part of the contract. The print's engineering detail shows the exact location and length of the proposed track. When engineering cost estimate has been prepared and an under-

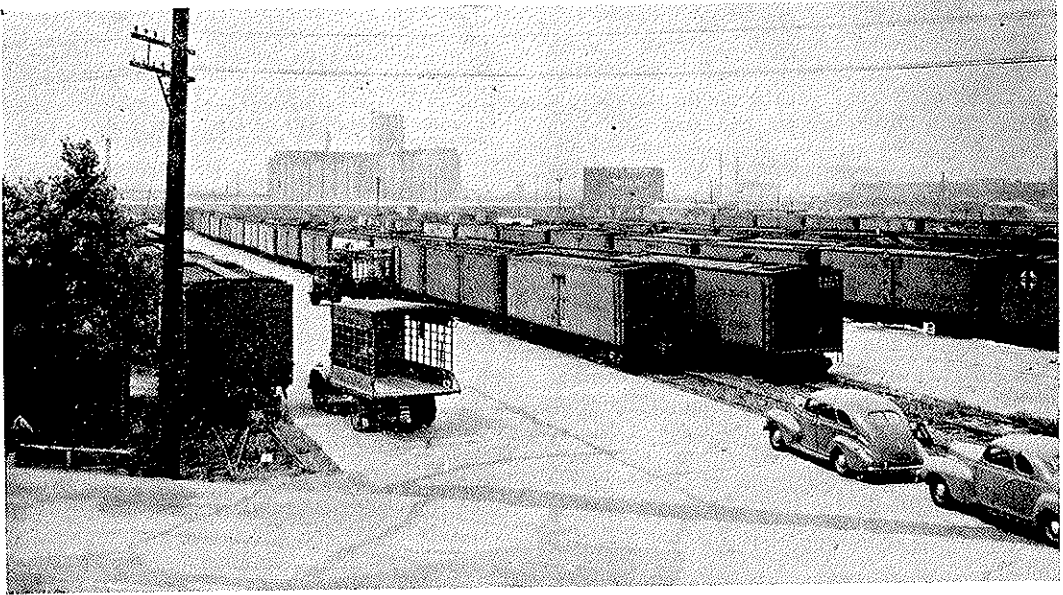


MANY INDUSTRIES have track or track extension service to their plants. Here is shown a typical industry spur provided by the Santa Fe under contract.

standing reached with the industry as to assumption or apportionment of the cost, the data is submitted to the general manager for review.

If approved, a contract then is prepared between the Santa Fe and the industry, usually on a standard form of industry track agreement, which then receives the formal approval of the chief engineer and, in some cases, of the state solicitor. If the term of the contract or the amount involved exceeds a certain limit, which is often the case, the general manager forwards the agreement to Chicago with a

loading or unloading tracks usually stipulate that the industry will pay the cost of that portion of the track beyond the railway's existing track clearance point, and the entire cost (or an equitable share thereof in case other industries are served by the track or a part thereof, or the railway shall make use of the track as provided) of maintaining and renewing that portion of the track beyond the clearance point, the railway to be the judge of the necessity for and character of maintenance required. Such expense will include any cost to which the railway may be put in



CHICAGO PRODUCE TERMINAL, through which the greater part of the fruits and vegetables for Chicago—and reconignment to other destinations—are handled, is directed by the contract department.

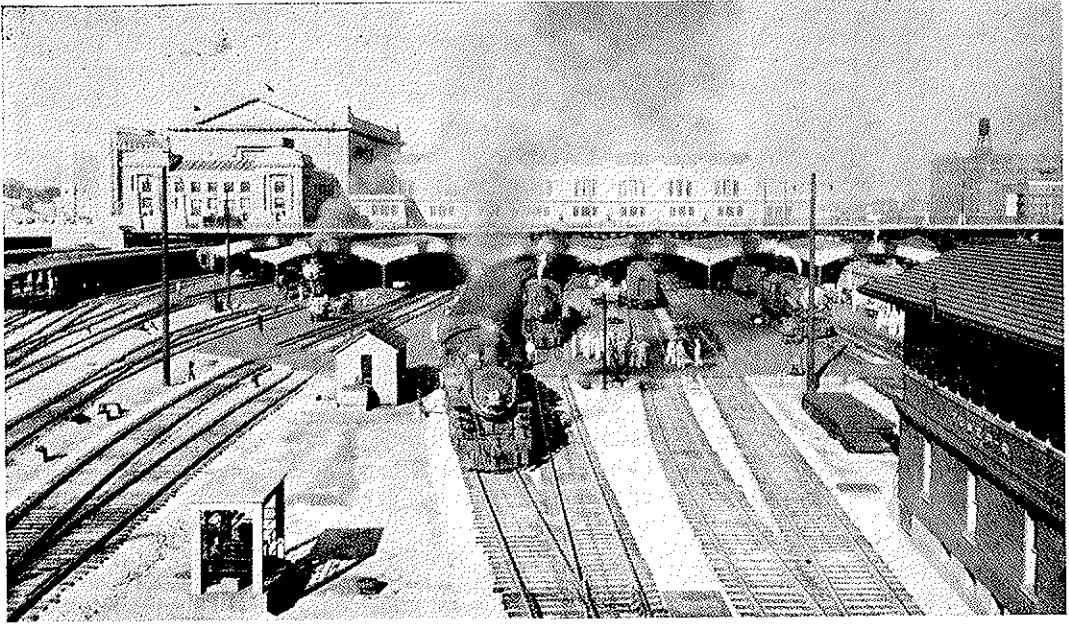
resume of all factors bearing on the transaction. He incorporates in his report the views and recommendations of the traffic department and makes his own recommendation. With this submission, the contract department of the vice-president's office is in a position to review the composite result of the findings of the several departments and to determine whether all factors of the transaction have been properly considered; also, whether the agreement is in harmony with Santa Fe policies from a system viewpoint as distinguished from local consideration of the immediate case. The instrument then is placed in line for approval by the law department, if necessary, and for signature by a vice-president or, in some cases, by the president.

Contracts signed by industries desiring the construction of private switching or

the way of paving, sewers, crossing protection or other work because of the existence of the track. There are other articles in the contract safeguarding the rights and privileges of both parties.

The same general prerequisites and procedures enter into agreements relating to other contractual matters—leases of industrial sites and many others—and the industry agreement and contracts based thereon were merely used by way of illustration of the general course of handling.

In its broad operations, the Santa Fe has numerous joint facility contracts or operating agreements with other railways. There are many factors involved, necessitating lengthy and detailed negotiations. In some instances, the Santa Fe owns the trackage; in others, the facility is owned by another railway, and in others the track-



NUMEROUS JOINT FACILITY contracts or operating agreements are in effect between the Santa Fe and other railroads, which include the use of tracks, depots and right of way facilities. The Kansas City Union Station, depicted above, comes under this category.

age or facility is jointly owned. Such joint arrangements are a convenience and a necessity resulting in overall benefits to patrons and carriers alike.

Joint facility arrangements had their origin in the early days of railway con-

struction. For example, rather than build a new line parallel to another railway's tracks, which would involve needless and costly construction, particularly in mountain territory, a railway would enter into an agreement with the established line for



LOS ANGELES UNION STATION, pictured here, also is operated jointly by the Santa Fe and other railways.

joint use of its tracks and facilities for specified distances.

The Santa Fe has many such arrangements: between Mojave and Kern Junction, California, over the Tehachapi; between Daggett and Riverside Junction, California, through Cajon Pass; between Pueblo and Denver, Colorado; Houston and Algoa, Dallas and Fort Worth, Texas; Plains and Pequot, Illinois; Enid and Blanton Junction, Oklahoma; Bee Creek and St. Joseph, Missouri, and others. Joint terminal arrangements exist between the Santa Fe and other carriers at Chicago, Kansas City, St. Joseph, Wichita, Denver, Dallas, Houston, Los Angeles, and there are numerous other joint arrangements with respect to union passenger depots and freight terminals, and with respect to junction, belt and terminal railways in regard to switching and other operations and use of facilities.

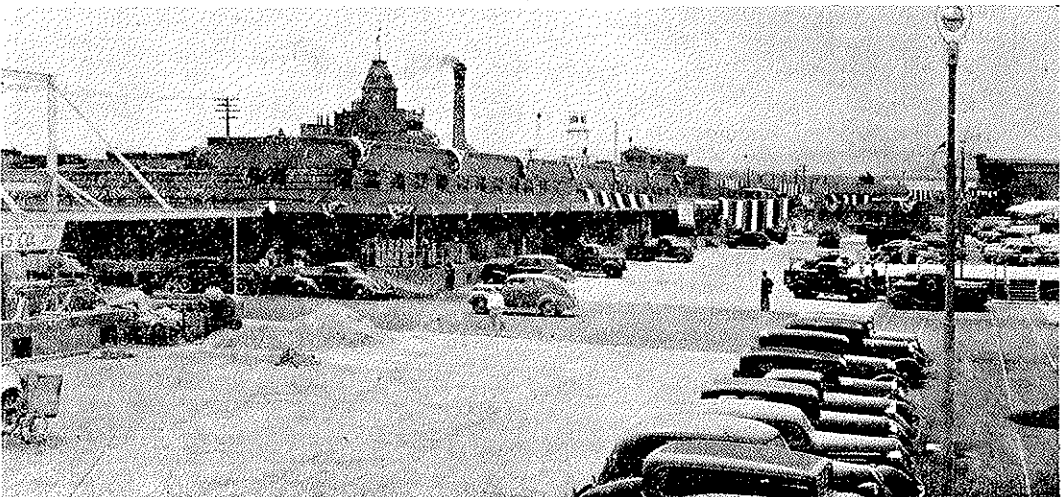
During the past decade, the Santa Fe has executed a large number of trucking contracts with private draying firms which handle the Santa Fe's "pickup and delivery" service on less than carload freight between the Santa Fe's various freight houses and private industries—door-to-door delivery. There are other contracts covering the transfer of interline less than carload freight between the Santa Fe and other railways at terminals or junctions.

In the case of licenses for the location of pipe or wire lines on Santa Fe property, an important provision of each is that such lines will not at any time be a source of danger to or of interference with the present or future tracks, roadbed and property

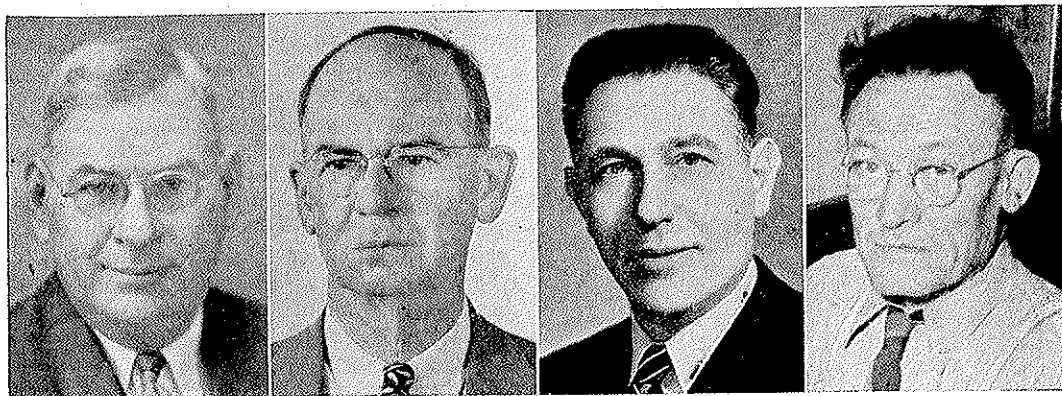
of the railway or its safe operation. Licenses also are granted for the temporary storage of materials along the Santa Fe's right of way and for other uses none of which must endanger or interfere with the operation of trains.

The Santa Fe, and other railways, have and frequently obtain additional lands paralleling their right of ways in order that they may properly handle their present and anticipated operations, may locate new industries thereon, and may provide for the expansion of industries which they now serve. The railways often sell or lease the unoccupied land. When leasing, in addition to the rental fee and other provisions, the use which the lessee will make of the site is set forth in the lease. The railway must see that no condition harmful or detrimental to its operations or to its patrons will exist and must take proper precautions in relation to anticipated community growth and the welfare of the community.

Deeds to the company, copies of deeds from the company, original contracts, leases and instruments of every description, except those concerning the financial management of the company which are designed for retention in the Santa Fe's New York office, are filed with the secretary and assistant secretaries. It is the duty of the Santa Fe's general auditor to know that in so far as revenue and the accounts of the company are affected, all contracts or leases are properly carried out. It also is the duty of all Santa Fe department heads to know that the provisions of all contracts affecting their respective departments are complied with.



DENVER PRODUCE MARKET is operated on a joint facility arrangement.



SUPERINTENDENTS OF SPECIAL SERVICE. Left to right—J. J. Brennan, Topeka; W. B. Jones, Amarillo; Fred F. Phillips, Los Angeles, and J. M. Rooney, Galveston.

Special Service Department

EACH general manager of the Santa Fe's four grand operating divisions has the assistance of a special service or railway police department, charged with the protection of Santa Fe patrons and their property, and the safe-guarding of Santa Fe institutions and premises.

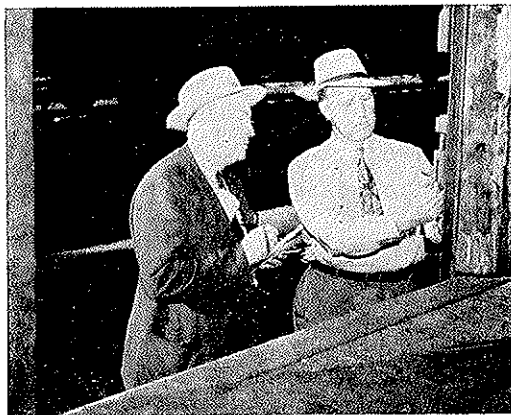
Through its special service department, the Santa Fe enjoys the mutual co-operation and assistance of municipal, county, state and Federal law enforcement agencies, and the nation-wide services of the protective section of the Association of American Railroads.

Each grand division special service department is directed by a superintendent of special service, who is assisted by a staff of supervisors and a necessary complement of special officers. The latter ride trains, police freight yards, depots, shops and other facilities, conducting a wide range of investigations and taking an active part in safety procedures, damage claim prevention and related matters—all of which requires a good general knowledge of Santa Fe operations.

Few of us realize the important part played in wartime by railway police in the successful culmination of hostilities. Their protective efforts constantly guarded the supply lines which linked American factories, defense plants, training camps, supply depots and the distribution centers of cities and ports with American and allied combat forces. The night after Pearl Harbor, Santa Fe officials began recruiting a corps of railway guards, recognizing the

peril to the entire war effort should Santa Fe service be interrupted by sabotage. By the next morning, every sizeable Santa Fe bridge and important facility was under armed guard.

Railway special service is recognized as one of the outstanding police organizations in the country. The protective section of the Association of American Railroads comprises the directing officers of railway special service departments throughout the United States and Canada. The committee of direction, within that organization, meets upon call and co-operates to propagate improved methods among railway special service departments. A major crime committed against any Class One railway



INSPECTING seal on boxcar at Kansas City are, left to right, R. O. True, special agent, and E. D. Saunders, assistant special agent.



UNIFORMED special service officers at Barstow station. Left to right—J. Ed Harris, E. H. Reimund, R. H. Ott, C. J. Woodworth, K. J. Davidson. Special service officers regularly are assigned to Santa Fe yard terminals and shop yards at points where the latter facilities are extensive.

receives the same consideration and thorough investigation by member roads as the road directly interested.

It is doubtful if there is any police organization in the United States that has a communications means comparable to the railway special service departments which have at their disposal the telephone and telegraph facilities of all railways, including all Western Union offices. The Federal Bureau of Investigation in Washington serves as an exchange bureau in the matter of information and co-operates wholeheartedly in many ways with the railway police departments.

The special service of the Santa Fe is organized as a protective organization along lines similar to that of a large city. The members of the department are charged with the responsibility of protecting both freight and passengers while in transit and on Santa Fe properties, protection of the United States mail and railway express, and of other services and facilities provided by the Santa Fe.

Certain matters pertaining to Santa Fe service are referred to the department by the management, which conducts investigations in connection with loss and damage to freight and baggage. All instances of theft from interstate shipments are reported to the Federal authorities. There are numerous instances in which the Santa Fe special service department has called upon the F.B.I. to assist in investigations.

Railway special service officers regularly are assigned to Santa Fe yard terminals and shop yards at points where the latter facilities are extensive. Those officers keep trespassers and others away from the premises. They also check freight trains to see that freight-car seals are intact. They prevent theft of company material which must necessarily be stored or placed at various unguarded locations along the line. They eject trespassers from freight trains and prevent them from boarding trains on departure from terminals.

Special officers ride trains constantly, on the lookout for suspicious persons or actions, and co-operate diligently with military authorities in troop and supply movements. Military police ride Santa Fe passenger trains with the special officers supervising traveling military personnel. All passenger train supervision is conducted inconspicuously. Few travelers realize the protection given them while traveling on trains.

Train, engine, and yard men and other employees co-operate with the special service department by reporting suspicious characters and circumstances which come to their observation, and by means of that co-operation the special service department is enabled quickly to solve many problems. The department likewise has the co-operation of all law enforcement officers, from Federal officers to town marshals, in every state, county, city and hamlet throughout this nation and Canada.

The railway special service department



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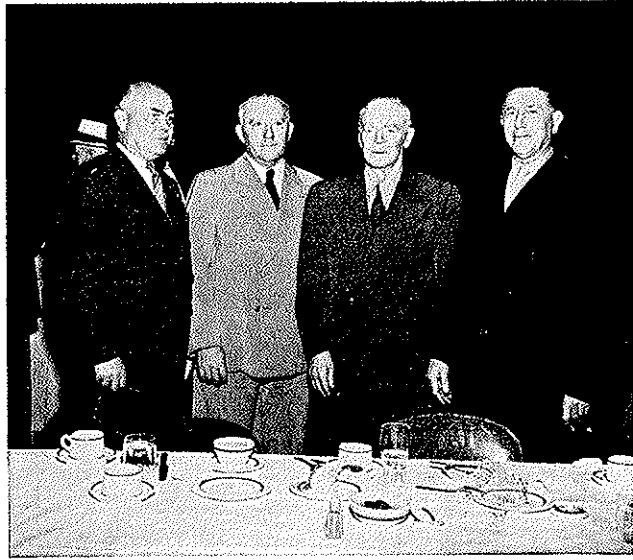
does much to stem juvenile delinquency. When a wandering or runaway boy is found in the railway yards or on trains, he is kindly questioned, his name and home address obtained, and his parents notified. In this manner, many a boy has been returned to the shelter of his home and parents.

If it were not for such considerate action on the part of the railway officer, the boy in many cases would become a juvenile delinquent. Railway special officers call upon parents and school teachers, directing their attention to the danger, both physical and moral, to which children are exposed who are allowed to run at large and to trespass upon railway yards and right of ways.

Although the Santa Fe in early days employed guards at various places throughout the rapidly extending Santa Fe lines, it was not until the early 1880's that a special service department, as such, came into existence. In those days, train hold-ups, practically unheard of today, were effected by armed gangs. Solving some of those desperado crimes constituted the first duties of the department. Particularly did Wells-Fargo and other express companies utilizing railway services suffer from hold-ups. For lengthy periods, armed guards rode in train baggage cars. Holdup gangs were prevalent in the states of New Mexico, Colorado, Kansas, Texas, Indian Territory (now Oklahoma) and Missouri.

Early-day railway special officers were chosen solely for their ability in the use of firearms, as well as bravery and physical stability, and many of them sacrificed their lives in the line of duty.

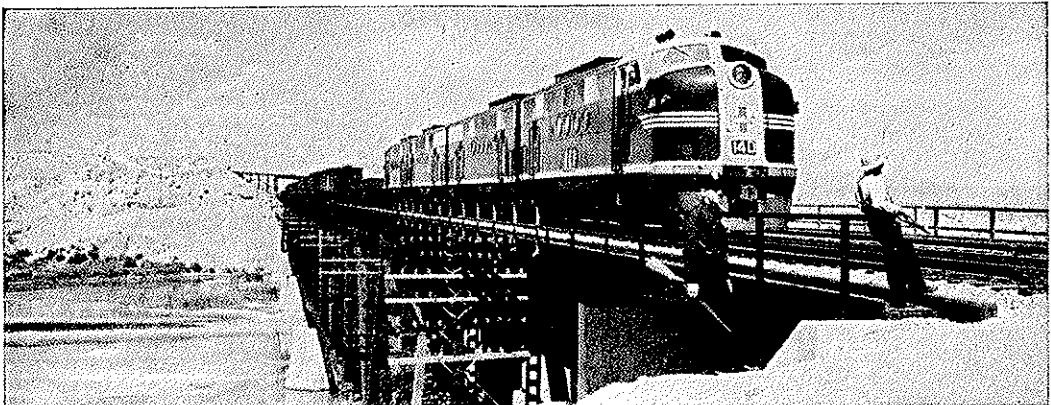
Today's special officers are schooled in many ways and are taught to meet and intelligently handle a variety of situations.



SANTA FE SPECIAL SERVICE department has the co-operation of all law enforcement officers, from Federal officers to town marshals. The group pictured above was taken at a luncheon of the California Peace Officers' Association in Los Angeles. Left to right—Col. F. C. Lynch, manager, Los Angeles Safety Council; E. Raymond Cato, chief, State Highway Patrol; Robert E. Clark, U. S. marshal, and Fred F. Phillips, Santa Fe superintendent of special service.

They are familiar with various state laws and are in a position to aid both Santa Fe attorneys and those of prosecuting authorities. Set rules govern the conduct of special officers in handling criminal matters.

The files and records maintained by each Santa Fe superintendent of special service are among the best of railway special service departments in the nation. Prominent are photographs of known and potential railway thieves who prey on railways and their patrons. The names of such known criminals are card indexed. This card in-



SPECIAL GUARDS at Colorado River bridge at Topock, Ariz. Left to right—O. B. Hall, special officer, and J. W. Kirlog, bridge guard.

dex system has reached the proportion of several hundred thousand names and includes criminal records, personal injury "sharks," wire thieves, "jewel" thieves (who steal brass from car journal boxes), baggage and Pullman car thieves.

The Henry system of fingerprint classification also is used, enabling the department to identify an offender regardless of any alias under which he may operate. It is not unusual for the various law enforcement agencies to refer matters to railway special service departments for information.

At the more important Santa Fe stations and terminals, special officers are on duty. At train time and during the intervals prior to train arrivals and departures they assist the traveling public all possible, looking out for aged and young, seeing that the former are properly assisted by

station and train attendants, and safeguarding the latter in all necessary ways.

Not only have railway special service departments protected the railway properties and material in transit from malicious damage and general harm, but they have protected the public from the traveling criminal, and, in many instances, have been responsible for the solution of major crimes. Railway police, through their railways, are the connecting link between all American and Canadian cities, co-operating with the law enforcement agencies of those cities and of the nation in the never-ending task of crime prevention.

That there was no notable instance of railway sabotage during World War Two, and that crimes against railways in general have been materially reduced, is due to the thorough, unobtrusive manner in which the railway special service departments do their jobs.

Chicago, Illinois

February 1, 1946